MEGHAN PRYOR

Translational PKPD and QSP Expert

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SUMMARY

I have over 17 years of experience in mathematical modeling, with more than 13 years in the pharmaceutical industry. I am passionate about PKPD and QSP modeling, as well as leadership development and mentoring. My success is driven by effectively leveraging quantitative pharmacology modeling capabilities and results to build trust and alignment among key stakeholders.

INDUSTRY EXPERIENCE (13+ years)

U.S. Head of Translational PKPD
Johnson & Johnson Innovative Medicine, 2019 – Present

Develop robust human dose projection strategies via quantitative pharmacology to enable efficient compound discovery and translation from early preclinical discovery through early development

- PKPD modeling lead on 13 small molecule, 4 targeted protein degrader, and 1 peptide programs and counting. Due diligence modeling lead on more than 8 reviews of possible external assets
- *Select Key Impacts:*
  - Declared 3 new molecular entities (NMEs) with 2 first in human (FIH) starts that are ongoing in the clinic
  - Enabled confident no-go decision on 6+ programs allowing valuable resources and time to be reallocated to projects with a higher probability of success
  - Informed go decision on a high priority program by establishing pivotal structure-activity relationships (SAR) for compounds to balance the exposure necessary for efficacy with the potential for on-target toxicity

PhysioPD Engineer, QSP Modeling
Rosa & Co, LLC, 2012 – 2019

Built Quantitative Systems Pharmacology (QSP) models to enable decision making across all stages of the drug discovery and development pipeline

- Lead QSP modeler on more than 10 projects including 5+ small molecule platforms, 2+ large molecule platforms, & 5+ target ID/biomarker assessment focused platforms
- *Select Key Impacts:*
  - Facilitated rigorous in vitro-in vivo extrapolation, boosting confidence in the translation of preclinical data to clinical applications
  - Helped clients identify the optimal biomarker for clinical use to demonstrate successful target engagement, building confidence in understanding clinical outcomes and reducing risk in the clinic
  - Evaluated and ranked uncertainties and data gaps in clients' programs, allowing them to design studies that enhance the likelihood of success or facilitate quicker no-go decisions

RECENT LEADERSHIP

- ★ **People Leader since early 2022**
  Managing 3+ direct reports
- ★ **J&J Philip B. Hofmann Research Scientist Award, 2023**
  Major contribution in terms of leadership/original ideas/research leading toward better understanding of scientific phenomenon
- ★ **ISoP Outstanding Research Manuscript Award, 2023**
  Ramakrishnan et al 2023 CPT: P&SP
- ★ **Masala Mastermind, 2023**
  6-month exclusive group executive coaching for women leaders

EDUCATION

Doctor of Philosophy
Chemical Engineering
University of New Mexico
Edwards Research Lab
Dissertation passed with Distinction

Bachelor of Chemical Engineering
Chemical Engineering
University of Delaware
Ogunnaike Research Lab
Minors: Biochemical Engineering | Biomedical Engineering | Chemistry

Bachelor of Science
Quantitative Biology
University of Delaware

COMMUNITY INVOLVEMENT

- ★ **ISoP Member**
  QSP Special Interest Group LT, Secretary 22/23, Vice-Chair 24/25
- ★ **NIH Grant Reviewer, 2020-Present**
  Chair 2024 - Present

SKILLS

R | Monolix | Matlab | Simbiology
Python | Perl | JavaScript | FORTRAN

THERAPEUTIC AREAS

Immunology | Oncology |
Cardio Vascular | Neurology

ACADEMIC RESEARCH EXPERIENCE

Sept 2014 – **Johns Hopkins School of Medicine**, Baltimore, MD
Mar 2016   *Postdoctoral Research Fellow,* Biomedical Engineering Department; *Popel Lab*
- Triple Negative Breast Cancer Metastasis. Constructed a multi-scale mechanistic model to investigate breast cancer metastasis in the lung to assist in the repurposing of drugs for inhibition of metastasis
- Immuno-Oncology. Built a mechanistic T-cell signaling model and a multiscale mechanistic model including PK to explore the use of the adaptive immune response to target various forms of cancer through immune checkpoint blockade

Aug 2010 – **University of New Mexico**, Albuquerque, NM
Jul 2014   *Graduate Research Assistant,* Department of Chemical & Nuclear Engineering; *Edwards Lab*
- Researched the ErbB family of cell receptors via mathematical modeling. Developed spatial stochastic models to investigate membrane receptor dynamics and the impact on cell signal initiation and transduction. Also developed data analysis tools to predict cellular membrane confinement zone size and shape from single particle tracking data

Jul 2013 – **Los Alamos National Laboratory**, Los Alamos, NM
May 2014   *Graduate Research Assistant*, Center for Nonlinear Studies
- Graduate student guest collaboration extended into a Graduate Research Assistant (GRA) position. Built and trained rules-based models used for predicting cell signaling outcomes

Mar 2010 – **University of Delaware**, Newark, DE
Aug 2010   *Computer Simulations Engineer,* Department of Chemical Engineering; *Sandler Lab*
- Edited and adapted Molecular Dynamic and Monte Carlo simulations using Matlab and FORTRAN. The programs are used in "An Introduction to Applied Statistical Thermodynamics" by Stanley I Sandler

Mar 2008 – **University of Delaware**, Newark, DE
Aug 2010   *Undergraduate Research Fellow*, Department of Chemical Engineering; *Ogunnaike Lab*
- Developed the initial stages of a multi-scale glycosylation process model for the control of monoclonal antibody glycosylation

INTERNSHIPS

Jan 2009 – **Rosa & Co. LLC**, San Carlos, CA
Jan 2010   *Modeling Intern*
- Researched wound healing, helped to prepare a grant, and worked on a mechanistic model for wound healing

Aug 2007 – **American Air Liquide**, Newark, DE
Dec 2007   *Surfactant Development Assistant*
- Researched different methods of enhanced oil recovery (EOR), different surfactants for EOR. Developed a computational model for in-situ combustion reactions and documented the developed model and how it is used

HONORS & AWARDS

- Philip B. Hofmann Research Scientist Award, J&J Innovative Medicine 2023
- ISoP Outstanding Research Manuscript, ACoP13 2023
- Passed Dissertation Defense with Distinction, University of New Mexico 2014
- NSF Research Highlight in IGERT annual NSF report, University of New Mexico 2013
- Integrating Nanotechnology with Cell Biology and Neuroscience IGERT Fellow, University of New Mexico 2011-2013
- New Mexico Consortium Travel Grant for 5th Annual q-bio Summer School, QBIO 2011
- Chemical Engineering Industrial Sponsor Undergraduate Research Award, University of Delaware 2010

PUBLICATIONS

- Androulakis, I. P., Cucurull-Sanchez, L., Kondic, A., Mehta, K., Pichardo, C., **Pryor, M.**, & Renardy, M. (2025). The dawn of a new era: can machine learning and large language models reshape QSP modeling? Journal of Pharmacokinetics and Pharmacodynamics 2025 52:4, 52(4), 1–14. https://doi.org/10.1007/S10928-025-09984-5

- Fostvedt, L., Zhou, J., Kondic, A. G., Androulakis, I. P., Zhang, T., **Pryor, M.**, Zhuang, L., Elassaiss-Schaap, J., Chan, P., Moore, H., Avedissian, S. N., Tigh, J., Goteti, K., Thanneer, N., Su, J., & Ait-Oudhia, S. (2025). Stronger together: a cross-SIG perspective on improving drug development. Journal of Pharmacokinetics and Pharmacodynamics, 52(1), 14. https://doi.org/10.1007/S10928-024-09960-5/FIGURES/2

- Frikke-Schmidt, H., Albarazanji, K., Qi, J., Frederick, D., Steffen, J., Kalyana-Sundaram, S., Meng, R., Devine, Z. H., Chen, T., Li, Q., Du, F., Ho, G., Liu, J., Riley, R., Gonzalez-Villalobos, R. A., Camacho, R. C., Nawrocki, A. R., **Pryor, M**., Lee, M., ... Player, M. R. (2024). Pan AMPK Activation Protects Tubules in Rat Ischemic Acute Kidney Injury. Journal of Pharmacology and Experimental Therapeutics, JPET-AR-2024-002120. https://doi.org/10.1124/JPET.124.002120

- Ramakrishnan, V., Friedrich, C., Witt, C., Sheehan, R., **Pryor, M.**, Atwal, J. K., Wildsmith, K., Kudrycki, K., Lee, S. H., Mazer, N., Hofmann, C., Fuji, R. N., Jin, J. Y., Ramanujan, S., Dolton, M., & Quartino, A. (2023). Quantitative systems pharmacology model of the amyloid pathway in Alzheimer's disease: Insights into the therapeutic mechanisms of clinical candidates. CPT: Pharmacometrics & Systems Pharmacology, 12(1), 62–73. https://doi.org/10.1002/PSP4.12876
    - ISoP 2023 Outstanding Research Manuscript Award Winner

- Ayyar, V. S., Lee, J. B., Wang, W., **Pryor, M.,** Zhuang, Y., Wilde, T., & Vermeulen, A. (2022). Minimal Physiologically-Based Pharmacokinetic (mPBPK) Metamodeling of Target Engagement in Skin Informs Anti-IL17A Drug Development in Psoriasis. Frontiers in Pharmacology, 13, 862291. https://doi.org/10.3389/FPHAR.2022.862291/BIBTEX

- Moss, R. B., **Pryor, M. M.,** Baillie, R., Kudrycki, K., Friedrich, C., Reed, M., & Carlo, D. J. (2020). Higher naloxone dosing in a quantitative systems pharmacology model that predicts naloxone-fentanyl competition at the opioid mu receptor level. PLOS ONE, 15(6), e0234683. https://doi.org/10.1371/JOURNAL.PONE.0234683

- K.A. Norton, **M. McCabe Pryor,** and A.S. Popel. "Multiscale Modeling of Cancer" In: *Handbook of Mathematical Methods in Cancer Biology*, National Cancer Institute, 2015.

- **Pryor, M. M**. C., Steinkamp, M. P., Halasz, A. M., Chen, Y., Yang, S., Smith, M. S., Zahoransky-Kohalmi, G., Swift, M., Xu, X. P., Hanien, D., Volkmann, N., Lidke, D. S., Edwards, J. S., & Wilson, B. S. (2015). Orchestration of ErbB3 signaling through heterointeractions and homointeractions. Molecular Biology of the Cell, 26(22), 4109–4123. https://doi.org/10.1091/mbc.E14-06-1114
    - Featured in the *Mol Biol Cell* Second Special Issue on Quantitative Cell Biology, November 2015

- Halasz, A., **McCabe Pryor, M.,** Wilson, Bridget S. and Edwards, Jeremy S. "Spatio-Temporal Modeling of Membrane Receptors" In*: Modeling Cellular Systems*, Springer, 2015.

- **Pryor, M. M**. C., Low-Nam, S. T., Halász, Á. M., Lidke, D. S., Wilson, B. S., & Edwards, J. S. (2013). Dynamic transition states of ErbB1 phosphorylation predicted by spatial stochastic modeling. Biophysical Journal, 105(6), 1533–1543. https://doi.org/10.1016/j.bpj.2013.07.056

- Halász, A. M., Lai, H. J., **McCabe Pryor, M**., Radhakrishnan, K., & Edwards, J. S. (2013). Analytical solution of steady-state equations for chemical reaction networks with bilinear rate law. IEEE/ACM Transactions on Computational Biology and Bioinformatics, 10(4), 957–969. https://doi.org/10.1109/TCBB.2013.41

- Krishnan Radhakrishnan, Halász, Á., **McCabe, M. M**., Edwards, J. S., & Wilson, B. S. (2012). Mathematical simulation of membrane protein clustering for efficient signal transduction. Annals of Biomedical Engineering, 40(11), 2307–2318. https://doi.org/10.1007/s10439-012-0599-z

- St. Amand, M., Millili, P., ***McCabe, M.,*** and Ogunnaike, B. "Strategic vision for integrated PAT and advanced control in biologics manufacturing*"* In: *Cenk Undey, Duncan Low, Mel Koch, Jose Menezes (ed) Process Analytical Technology applied in Biopharmaceutical Process Development and Manufacturing.* Taylor and Francis Group, LLC, of Boca Raton, Florida. December 2011.

POSTERS

- Josep Llaveria, Suraj Adhikary, Christophe Buyck, Santiago Canellas, Jose Marie Cid, Ben Danna, Francisca Delgado, Elsie Diaz, Alejandro Dieguez-Vazquez, Lichao Fang, Omar Fernandez-Candelaria, Garret Gibbons, Vincent N. A. Klaren, Daniel J. Krosky, Antonietta Impagliazzo, Maria Lourdes Linares, Carlina Martinez Lamenca, Antonio Misale, **Meghan Pryor,** Jackie Shang, Javier Suarez "Discovery of a series of pyrazolopyrimidine as spermine oxidase (SMOX) inhibitors" AngloNordic Med Chem Symposium June 2025

- Ling, I., Leung, M., Piantone, A., Sinha, V., Song, D., Scott, B., **Pryor, M.,** Verbruggen, K., La, D., Tikhonov, I. and Ceulemans, K., "First-in-human results from a phase 1 single-and multiple-ascending dose study in healthy participants assessing the safety, pharmacokinetics, and pharmacodynamics of the interleukin-17A inhibitor JNJ-81241459" Journal of Investigative Dermatology, ISDS November 2023

- Henriette Frikke-Schmidt, Stephen Beck**, Meghan Pryor**, Rong Meng, Joseph Strizziere, Matthew M Rankin, Lili Guo, Fuyong Du, Shefali Patel, Andrea R Nawrocki, Jan M Dieleman, Mark P de Caestecker, Alessandro Pocai "Differential Renal Response to Dexamethasone in Rats and Mice Following AKI" Journal of the American Society of Nephrology 2023

- Vivaswath S. Ayyar, Jong Bong Lee, Weirong Wang, ***Meghan Pryor***, Yanli Zhuang, Thomas Wilde, An Vermeulen "Minimal physiologically-based pharmacokinetic (mPBPK) metamodeling of targe engagement (TE) in skin informs anti-IL-17A drug development in psoriasis" ACoP13 November 2022

- Vidya Ramakrishnan, Christina Friedrich, Colleen Witt, ***Meghan Pryor***, Michael Dolton, Jasi Atwal, Kristin Wildsmith, Katherine Kudrycki, Robert Sheehan, Seung-Hye Lee, Hans Peter Grimm, Roxana Aldea, Norman Mazer, Carsten Hofmann, Ronald Gieschke, Reina Fuji, Jin Yan Jin, Saroja Ramanujan, Angelica Quartino "A Quantitative Systems Pharmacology Model of Alzheimer's Disease Pathology and Treatment Modalities" ACoP November 2020

- Ronald B. Moss, Dennis J. Carlo, Christina Friedrich, Katherine Kudrycki, R. Baillie, ***Meghan Pryor***, Mike Reed "QSP modeling predicts higher naloxone doses will safely reverse more opioid overdoses and save lives" ACoP November 2020

- Christina Friedrich, Colleen Witt, ***Meghan Pryor,*** Katherine Kudrycki, Rebecca Baillie, Robert Sheehan, Michael Reed "How does mechanistic QSP modeling reduce R&D risk in data poor disease areas such as central nervous system (CNS) diseases?" ACoP November 2020

- Christina Friedrich, Rebecca Baillie, Michael Weis, ***Meghan Pryor,*** Vincent Hurez, Katherine Kudrycki, Michael Reed "Using Mechanistic Quantitative Systems Pharmacology (QSP) Models To Connect Biomarkers To Clinical Disease Activity Scores Examples In Atopic Dermatitis And Psoriasis" ACoP November 2020

- Rebecca Baillie, Ronald B. Moss, Dennis J. Carlo, Christina Friedrich, Katherine Kudrycki, ***Meghan Pryor,*** Mike Reed "QSP modeling predicts higher naloxone doses will safely reverse more opioid overdoses and save lives." Applied BioMath QSP Day November 2020

- Christina Friedrich, Takashi Ito, Katherine Kudrycki, ***Meghan Pryor,*** Vincent Hurez , Shinnosuke Yamada, Naoki Kiyosawa, Masatoshi Nishimura, Ryo Atsumi, Kiyoshi Morimoto "A simulation study for clinical efficacy of an anti ORAI1 antibody (DS 2741a) on atopic dermatitis using QSP modeling for preclinical to clinical translation" PAGE 2019

- Christina Friedrich, Ben Weber, ***Meghan Pryor***, Colleen Witt, Jens Borghardt, Bernd Disse, Claudia Dallinger, Abhya Gupta, Birgit Jung, Andy Fowler, Dave Singh "Development of the Respiratory PhysioPD Platform, a QSP Model to Investigate Biological Mechanisms Underlying Bronchoconstriction" ACoP9 October 2018

- Sergio Iadevaia, Christina Friedrich, ***Meghan Pryor***, Colleen Witt, Liming Zhang, Lin Xu, Helene Faessel, Katherine Kudrycki, Mike Reed, Majid Vakijynejad "Quantitative Systems Pharmacology Model to Quantify Benefits of DAAO Inhibition in Schizophrenia" ACoP October 2018

- Katherine Kudrycki, Michael Weis, ***Meghan Pryor***, Rebecca Baillie, Vincent Hurez, Douglas Chung, Mike Reed, Christina Friedrich "PhysioPD Research Utilizes Mechanistic Physiological Models to Enhance Immunology Research and Drug Development"
  - Applied BioMath QSP Day, Cambridge, MA, April 2018
  - ACoP8, October 2017

- Christina Friedrich, Katherine Kudrycki, Michael Weis, ***Meghan Pryor***, Vincent Hurez, Rebecca Baillie, Mike Reed "PhysioPD™ Research Enhances Dermatology Research and Drug Development Using Mechanistic Physiological Modeling" 8th American Conference on Pharmacometrics, October 2017

- Christina Friedrich, Mike Reed, Rebecca Baillie, Katherine Kudrycki, Michael Weis, ***Meghan Pryor***, Douglas Chung "Using Mechanistic Physiological Models to Investigate Responder/Non-Responder Attributes Retrospectively and Prospectively to De-Risk Drug Development" 8th American Conference on Pharmacometrics, October 2017

- Katherine Kudrycki, Michael Weis, Mike Reed, ***Meghan Pryor***, Rebecca Baillie, Christina Friedrich "Mechanistic physiological modeling as a tool for enhancing dermatology research" Society for Investigative Dermatology (SID) Annual Meeting, March 2017

- CM Friedrich, CM Witt, ***MM Pryor***, T Rooney, A Genevois-Borella, MC Obinu, A Guerreiro, J Konop, MJ Reed, Z Bocskei "Application of a quantitative systems pharmacology (QSP) model to evaluate xCT inhibition as a target for central nervous system diseases" World Conference on Pharmacometrics, 2016

- Christina M. Friedrich, James Soper, Colleen M. Witt, ***Meghan M. Pryor***, Lauren Martens, Dooyoung Lee, Kelley Larson, Matthew Townsend, Cuyue Tang, Holger Patzke, Gerhard Koenig "A Quantitative Systems Pharmacology Platform of Brain and Serum Progranulin (PGRN) to Investigate Targets in Frontotemporal Dementia (FTD)" ACoP 2016

- ***McCabe Pryor, M.,*** Wang, B., Popel, A. S. "A systems biology model of naïve T-cell activation to explore immune checkpoint blockades" JHU-Medimmune Science Day, September 2015

- ***McCabe, M.,*** Low-Nam, S., Halasz, A., Lidke, D., Wilson, B., and Edwards, J. "Repeated Interactions between ErbB1 Receptors and the Impact on Signal Initiation"
  - Winter q-bio Meeting, Honolulu, HI, February 2013
  - AIChE Annual Conference, Pittsburgh, PA, October 2012
  - 6th q-bio Conference, Santa Fe, NM, August 2012

PRESENTATIONS

- Panelist at ACoP14 Cross-SIG Session, November 2023
- Volak, L. & **Pryor, M.** "Importance of accurate protein binding measurements for establishing PK/PD in vitro-in vivo correlation (IVIVC)" HESI PROTACs and Molecular Glues Safety Workshop, October 2021
- ***McCabe Pryor, M.,*** Low-Nam, S., Lidke, D., Wilson, B., and Edwards, J. "Spatial Stochastic Model Reveals Dynamic ErbB1 Activation State Shuffling" West Virginia University, Department of Mathematics – Invited Talk, Morgantown, WV, November 2013
- ***McCabe, M.,*** Low-Nam, S., Lidke, D., Wilson, B., and Edwards, J. "Impact of Asymmetric Activation and Membrane Landscape on ErbB1 Receptor State" The 7th q-bio Conference – Contributed Talk, Santa Fe, NM, August 2013
- ***McCabe, M.,*** Low-Nam, S., Lidke, D., Wilson, B., and Edwards, J. "Dynamic transition states of ErbB1 phosphorylation predicted by spatial-stochastic modeling" NMC Bio-initiative Workshop – Invited Talk, Los Alamos, NM, May 2013.

TEACHING EXPERIENCE

October 2015	**Invited Lecturer, Introduction to Systems Biology**
	University of Delaware
	• "Systems Biology Modeling: Examples of Both Stochastic and Deterministic Approaches"
Spring 2015	**Guest Lecturer, Theory of Cancer**
	Johns Hopkins University
	• Taught two sections: Cellular Signaling by EGF and Cancer Immunology
August 2013	**Teaching Assistant, Cell Signaling Course**
	7th q-bio Summer School
	• Lead journal clubs and assisted summer students in learning BioNetGen rule-based modeling
Spring 2011	**Teaching Assistant, Process Controls & Dynamics**
	University of New Mexico, Department of Chemical & Nuclear Engineering
	• Taught lectures, helped students understand material via office hours, and graded homework