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Louis R Joslyn

Modeling and simulation scientist who builds mechanistic models of the immune system to drive dosing and design decisions for therapeutics, and builds machine learning and AI tools to enable better decision making in drug development..

Professional Experience

2023–Present **Principal Scientist, Modeling & Simulation - Genentech**
Preclinical & Translational Pharmacokinetics & Pharmacodynamics
Genentech, Inc., South San Francisco, CA.

- Developed mechanistic PK/PD & Quantitative Systems Pharmacology (QSP) models for therapeutics in oncology, cancer immunotherapy and immunology
- **Oncology & Cancer Immunotherapies**: Developed reusable QSP platform models adopted across multiple programs for TCR-engineered & CAR T cell therapies, ADCs & T cell bispecifics.
- **Immunology**: Developed reusable QSP Platform models to help molecular design for bispecifics and trispecifics in COPD and IBD indications.
- **Impact:** Provided quantitative decision support for >12 oncology and immunology programs, including therapeutic design, first-in-human dose selection and clinical translation strategies.
- **Technology development:**
  - Logical Understanding of Complex sYstems (LUCY): a multi-agent AI framework that utilizes multiple 'experts' to design, calibrate and return mechanistic models based on a single user prompt and dataset.
  - LEAP: A method developed in-house that utilizes bioinformatics approaches to analyze genomic data (scRNAseq or bulk RNAseq) and predict clinical TMDD for large molecule therapeutics.
  - Digital Twins: co-developer of gQSPTwin, a tool that automates digital twin generation.
- **Mentorship:** Mentored 5 total interns in QSP-related AI/ML methods & software

2021–2023 **Senior Scientist, Modeling & Simulation – Genentech**

- **Oncology & Cancer Immunotherapies**: Developed Quantitative Systems Pharmacology (QSP) models for TCR-engineered T cells and T cell bispecifics in oncology and cancer immunotherapy
- **Impact:** Provided modeling support for preclinical research and development projects for biologics
- **Technology development:**
  - Digital Twins: employed digital twin method to analyze data for TCR-engineered T cell therapies.
  - Universal ODEs & data-driven modeling: explored tools that had potential to automate ODE model building, such as sparse identification of nonlinear dynamics (SINDy).

    - Neural ODEs: pioneered exploration of neural ODEs for preclinical PK of large molecules, resulting in a 2025 patent application and an ACoP 2024 poster.
- **Mentorship:** Mentored 2 interns in QSP-related AI/ML methods, tools and software

Education

2016 – 2021 **University of Michigan,** Ann Arbor, MI
PhD in Bioinformatics**.**
Dept. of Computational Medicine & Bioinformatics, Medical School
Research Advisors: Dr. Denise Kirschner & Dr. Jennifer Linderman
Dissertation: *Multiscale modeling of T cells in Mycobacterium tuberculosis infection*
Rackham Predoctoral Fellowship awarded in final year

2012 – 2016 **Simpson College,** Indianola, IA
B.A. in Computer Science
B.A. in Mathematics
Outstanding Senior in Math & Computer Science

Publications

1. **Joslyn LR***, Jafarnejad M*, Yadav R, Holder PG, Sanjabi S, Shivva V, Ramanujan S, Hosseini I. "A quantitative systems pharmacology model to inform clinical translation of dynamic PKPD relationships of engineered IL-15". European Journal of Pharmaceutical Sciences (2025).
2. Spinosa P, **Joslyn LR**, Ramanujan S, Gadkar K, Hosseini I. "A Generalized Minimal PBPK‐PD Model of Bispecific Antibodies: Case Studies and Applications in Drug Development". CPT: Pharmacometrics & Systems Pharmacology. (2025).
3. Li R, Grosskopf AK, **Joslyn LR**, Stefanich E, Shivva V. "Cellular kinetics and biodistribution of adoptive T cell therapies: from biological principles to effects on patient outcomes". AAPS Journal. (2025).
4. **Joslyn LR***, Huang W*, Miles D, Hosseini I, Ramanujan S. "Digital twins elucidate critical role of T_{scm} in persistence of TCR-engineered T cells in patients with solid tumors". npj Syst Biol Appl 10, 11 (2024). https://doi.org/10.1038/s41540-024-00335-7.
5. Yadav R, Schubbert S, Holder PG, Chiang EY, Kiabi N, Bogaert L, Leung I, … **Joslyn LR**, Hosseini I, … Shivva V, et al. "Translational PK/PD and the first-in-human dose selection of a PD1/IL15: an engineered recombinant targeted cytokine for cancer immunotherapy." *Frontiers in Pharmacology* 15 (2024): 1380000.
6. **Joslyn LR**, Flynn JL, Kirschner DE, Linderman JJ. "Concomitant immunity to M. tuberculosis infection." Scientific Reports 12, no. 1 (2022): 20731.
7. **Joslyn LR**, Linderman JJ, Kirschner DE. "A virtual host model of Mycobacterium tuberculosis infection identifies early immune events as predictive of infection outcomes." Journal of Theoretical Biology 539 (2022): 111042
8. Renardy M, **Joslyn LR**, Millar JA, Kirschner DE. "To Sobol or not to Sobol? The effects of sampling schemes in systems biology applications". Mathematical Biosciences 337, 108593. 2021.
9. **Joslyn LR**, Kirschner DE, Linderman JJ. "CaliPro: A calibration protocol that utilizes parameter density estimation to explore parameter space and calibrate complex biological models". Cellular and Molecular Bioengineering. 2020. https://doi.org/10.1007/s12195-020-00650-z

10. Wessler T†, **Joslyn LR**†, Borish HJ, Gideon HP, Flynn JL, Kirschner DE, Linderman JJ. "A computational model tracks whole-lung *Mycobacterium tuberculosis* infection and predicts factors that inhibit dissemination". PLoS Computational Biology. 2020. (†Co-1st authors).
11. Houben RM, Esmail H, Emery JC, **Joslyn LR**, McQuaid CF, Menzies NA, Sanz J, Shrestha S, White RG, Yang C, Cobelens F, 2019. "Spotting the old foe—revisiting the case definition for TB". *The Lancet Respiratory Medicine*, *7*(3), pp.199-201.
12. **Joslyn LR**, Pienaar E, DiFazio RM, Suliman S, Kagina BM, Flynn JL, Scriba TJ, Linderman JJ, Kirschner DE. "Integrating non-human primate, human, and mathematical studies to determine the influence of BCG timing on H56 vaccine outcomes". *Front Microbiol*. 2018;9(1):1734.
13. Wong EA†, **Joslyn LR**†, Grant NL, Klein E, Lin PL, Kirschner DE, Flynn JL. "Low levels of T cell exhaustion in tuberculous lung granulomas." *Infect Immun*. 2018;86(9):e00426-18. https://doi.org/10.1128/IAI.00426-18 (†Co-1st authors)
14. Cicchese JM†, Evans S†, Hult C†, **Joslyn LR**†, Wessler T†, Millar JA, Marino S, Cilfone NA, Mattila JT, Linderman JJ, Kirschner DE. "Dynamic balance of pro- and anti-inflammatory signals controls disease and limits pathology." *Immunol Rev*. 2018;285(1):147-167.
15. **Joslyn LR**, Croson C, Reed S. "Determining Critical Locations in a Road Network". Society for Industrial and Applied Mathematics Undergraduate Research Online. Vol. 7. (2014).

Abstracts

16. **Joslyn LR**, Ebers M, Lu J, Ramanujan S, Hosseini I. "A pharmacologically-informed neural ordinary differential equation framework to predict preclinical pharmacokinetics". American Conference of Pharmacometrics. (2024).

Patents

1. **Louis Joslyn**, Mohammad Jafarnejad, Iraj Hosseini, Saroja Ramanujan. "Systems and methods for quantitative pharmacological modeling of PK-PD relationships in cytokine-based cancer immunotherapy". Patent application submitted 2021.
2. **Louis Joslyn,** Iraj Hosseini, Saroja Ramanujan. "T-cell Therapy QSP Model and Method of Application thereof". Patent application submitted 2022.
3. **Louis Joslyn,** Iraj Hosseini. "Prediction of Preclinical Pharmacokinetics using a Neural Ordinary Differential Equation Framework". Patent application submitted 2025.
4. **Louis Joslyn,** Iraj Hosseini. "LUCY: a platform for agentic mechanistic model development". Provisional Patent application submitted 2026.
5. **Louis Joslyn,** Ran Li, Iraj Hosseini. "LEAP: a bioinformatics platform for predicting target mediated drug disposition". Provisional Patent application submitted 2026.

Book Chapters

1. **Joslyn LR**†, Renardy M†, Weissman C, Grant NL, Flynn JL, Butler JR, Kirschner DE. "Temporal and spatial analyses of TB granulomas to predict long-term outcomes". In Yoram Vodovotz and Gary An, editors, *Complex Systems and Computational Biology Approaches to Acute Inflammation: A Framework for Model-based Precision Medicine*. 2021. (†co-first authors)

Invited Oral Presentations (selected out of 27)

1. Joslyn LR. "LUCY: a multi-agent framework for mechanistic model development". American Conference on Pharmacometrics. October 13, 2026.
2. Joslyn LR. "A platform model to predict preclinical and clinical PK, efficacy and safety of ADCs". Pharmaceutical & Bioscience Society. Jan 15, 2026.
3. Joslyn LR. "Generating QSP-based Digital Twins for TCR-engineered T cell therapies". American conference of Pharmacometrics. October 21, 2025.
4. Joslyn LR. "Protein Language Models to incorporate PKPD considerations in early antibody design and generation". American Conference of Pharmacometrics. November 13, 2024.
5. Joslyn LR and Susilo, M. "Digital Twins and Applications". Simbiology Forum. November 14, 2024.
6. Joslyn LR. "A quantitative systems pharmacology model to characterize the PKPD relationship following treatment with IL15R agonists". AAPS PharmSci 360. October 24, 2023.
7. Joslyn LR and Huang, Weize. "From pharmacokinetics to cellular kinetics: generating QSP model-based digital twins for TCR-engineered T cell therapies." DIA Clinical Pharmacology Community Cell Therapy Seminar. Virtual. June 2, 2023.
8. Joslyn LR. "A quantitative systems pharmacology model to characterize the PKPD relationship following treatment with IL15R agonists: bonus discussion on digital twin methodologies". Internal invited presentation with pRED colleagues.
9. Joslyn LR. "Cellular Dynamics of TCR-engineered T cell therapies and Future Directions: A QSP modeling perspective. Preclinical and Clinical Development of Cell-based Cancer Immunotherapies Symposium. Pharmaceutical & BioScience Society International (PBSS) & Gene and Cell therapy Products Community of American Association of Pharmaceutical Scientists. November 15, 2022.
10. Joslyn LR. "A quantitative systems pharmacology model to characterize the PKPD relationship following treatment with IL15R agonists". American Conference of Pharmacometrics. November 10, 2021.
11. Joslyn LR. "*CaliPro*: a calibration protocol for complex mathematical models in biology". Fall DCMB Tools and Technology Seminar Series. University of Michigan Medical School. October 29, 2020.

Poster Presentations (Selected out of 26)

1. **Joslyn LR,** Ebers M, Lu J, Ramanujan S, Hosseini I. "A pharmacologically-informed neural ordinary differential equation framework to predict preclinical pharmacokinetics". American Conference of Pharmacometrics. November 13, 2024.
2. **Joslyn LR,** Huang W, Miles D, Hosseini I, Ramanujan S. "A Quantitative Systems Pharmacology (QSP) Model to Predict Kinetics of TCR-Engineered T Cell Therapies in Solid Tumors". AAPS PharmSci360. Boston, MA. October 18, 2022.
3. **Joslyn LR,** Huang W, Miles D, Hosseini I, Ramanujan S. "A Quantitative Systems Pharmacology (QSP) Model to Predict Kinetics of TCR-Engineered T Cell Therapies in Solid Tumors". Genentech Development Sciences Offsite. Monterrey, CA. October 20, 2022.
4. **Joslyn LR**, Linderman JJ, Kirschner DE. "*HostSim:* a whole host modeling framework to analyze the immune response to *Mycobacterium tuberculosis*". Keystone Symposia Global Health Series – Tuberculosis: Science Aimed at Ending the Epidemic. December 2-4, 2020.

5. **Joslyn LR**, Wong EA, Flynn JL, Kirschner DE. "Does Exhaustion Explain Low T-cell Functionality in the Mycobacterium Tuberculosis Granuloma?" Louis Joslyn, Eileen Wong, JoAnne Flynn, Denise E. Kirschner. 2017 Annual Meeting of the Society for Mathematical Biology. Salt Lake City, Utah. July 17-20, 2017. (MATHWORKS Poster Award Winner)

Professional Service, Mentorship & Leadership

- Session co-chair, American Conference of Pharmacometrics. AI/ML Roller Coaster. ACoP 2026.
- Session co-chair, American Conference of Pharmacometrics. Deep Learning in PKPD and Pharmacometrics: Diversity of Approaches and Applications. ACoP 2024.
- Standing & Contributing member of ISoP since 2021. Submitted multiple potential sessions for ACoP every year since 2023.
- Mentor of Early-Career Scientists.
    - Hosted 5 interns since 2021, resulting in poster presentations, department presentations & successful introduction of drug-development to emerging scientists from non-traditional backgrounds.
    - Panelist for University of Michigan Medical School "Industry Day" to discuss potential career paths for graduate students. 2025.
    - Invited Presenter and Panelist for multiple discussions with undergraduate scientists at Simpson College. 2022-2024.
- 2018-Present: Guest Lecturer at Simpson College averaging 1 lecture per year
- 2021-Present: Guest Lecturer at University of Michigan & Gettysburg College, 2x.

Selected Awards, Honors, & Grants

1. **International Society of Pharmacometrics (ISoP) Emerging Scientist Award.** Presented at the ACoP Opening Ceremony, October 11, 2026.
2. **Simpson College Recent Alumni Achievement Award.** Recognizes an alumnus who graduated within the past 15 years and has achieved notable professional advancement. 2024
3. **Genentech Development Sciences "Efficiency Champion" Award Winner.** Member of pharmacological sub-team that won the Genentech Development Sciences Efficiency Award (Internal) for accelerating timelines without compromising science. 2025.
4. **Genentech Development Sciences "Disruptive Thinker" Award Winner.** Member of cross-functional team that won the Genentech Development Sciences Disruptive Thinker Award (Internal) for applying transformative quantitative approach to drug development across immunology portfolio. 2025.
5. **Genentech Development Sciences "Scientific Innovation" Award Winner.** Won the Genentech Development Sciences Scientific Innovation Award (Internal) for development of T cell therapies platform QSP model. 2023.
6. **Genentech Development Sciences "The Voice" Award winner.** Member of Pharmacological sub-team that won the Genentech Development Sciences Voice Award (Internal) for data-driven decision making. 2021.
7. **University of Michigan Rackham Predoctoral Fellowship.** Stipend and tuition awarded for the final year of the Ph.D. March 2020.
8. **NCAA Postgraduate Scholarship**. Awarded to former student-athletes pursuing graduate degrees. 2016.
9. **Speech at Graduation.** Elected by graduating class to give a speech during graduation. Simpson College, Indianola Iowa. 2016.

10. **Outstanding Senior in Mathematics.** Selected by Faculty to be the outstanding senior in mathematics. Simpson College, Indianola Iowa. 2016
11. **Outstanding Senior in Computer Science.** Selected by Faculty to be the outstanding senior in computer science. Simpson College, Indianola Iowa. 2016.
12. **Wilson Science Award.** Scholarship presented to a senior who established an outstanding record in the Division of Natural Sciences. Simpson College, Indianola Iowa. 2016.