

Eric Cramer

cramere@ohsu.edu · Website · ORCID · Google Scholar

Education

PhD, Biomedical Engineering 2023–Present

Oregon Health & Science University, Portland, OR

Thesis: Mathematical and computational modeling for precision oncology using simulation and deep learning

Advisors: Dr. Young Hwan Chang & Dr. Laura Heiser

MD 2021–Present

Oregon Health & Science University, Portland, OR

NIH-funded Medical Scientist Training Program (MSTP)

M.S., Biomedical Informatics 2016–2018

Stanford University School of Medicine, Stanford, CA

Thesis: Predicting the incidence of pressure ulcers in the intensive care unit using machine learning

B.S., Biomedical Computation 2013–2017

Stanford University School of Engineering, Stanford, CA

Notation in Science Communication

Research Employment

Data Analyst Nov 2019–Jun 2021

Systems Neuroscience and Pain Laboratory, Stanford Medicine, Palo Alto, CA

- Developed distributed computing platforms for multi-institution research collaborations
- Analyzed symptom clusters in chronic pain patients using machine learning
- Built predictive models for patient satisfaction with opioid tapering interventions

Bioinformatics Engineer Oct 2018–Oct 2019

Institut Curie, Genotoxic Stress and Cancer Unit (UMR 3348), Paris, France

- Developed novel image analysis algorithms for confocal and spinning disk microscopy
- Conducted RNAseq, FACS, and mass cytometry computational analyses
- Built machine learning pipelines for experimental data visualization

Research Assistant & Data Manager Jun 2015–Aug 2018

Systems Neuroscience and Pain Laboratory, Stanford Medicine, Palo Alto, CA

- Managed the Collaborative Health Outcomes Information Registry (CHOIR) database
- Conducted independent undergraduate research as Stanford Bio-X Fellow
- Assisted with clinical trial data collection and grant writing

Neonatal Research Associate Jun 2014–Sep 2014

Santa Clara Valley Medical Center, San Jose, CA

- Analyzed umbilical cord blood biomarkers in relation to diabetes
- Evaluated effectiveness of NTrainer neonatal feeding device

Publications

Peer-Reviewed

Cramer EM, Lopez-Vidal T, Johnson J, Wang V, Bergman DR, Weeraratna A, Burkhart R, Fertig EJ, Zimmerman JW, Heiser LM, Chang YH. Temporal reassignment and correspondence evaluation with quality control for time-course imaging of 3D cell culture. *Cell Rep Methods*. 2025 Dec 15;5(12):101237. doi: 10.1016/j.crmeth.2025.101237. Epub 2025 Nov 18. PubMed PMID: 41260214.

Wang, K., Ait-Ahmad, K., Kupp, S., Sims, Z., **Cramer, EM.**, Sayar, Z., Yu, J., Wong, M.H., Mills, G.B., Eksi, S.E. and Chang, Y.H. UniFORM: Towards Universal Immunofluorescence Normalization for Multiplex Tissue Imaging. *Cell Reports Methods*, 2024. doi:10.1016/j.crmeth.2025.101172

Johnson JAI, Bergman DR, Rocha HL, Zhou DL, **Cramer E**, Mclean IC, et al. Human interpretable grammar encodes multicellular systems biology models to democratize virtual cell laboratories. *Cell*, 2025. doi:10.1016/j.cell.2025.06.048

Heussner RT, Watson CF, Eddy CZ, Wang K, **Cramer EM**, Creason AL, Mills GB, Chang YH. COEXIST: Coordinated single-cell integration of serial multiplexed tissue images. *PLOS Computational Biology*, 2025. doi:10.1371/journal.pcbi.1013325

Cramer EM, Ziadni M, Scherrer KH, Mackey S, Kao MC. CHOIRBM: An R package for exploratory data analysis and interactive visualization of pain patient body map data. *PLOS Computational Biology*, 2022. doi:10.1371/journal.pcbi.1010496

Ziadni MS, You DS, **Cramer EM**, Anderson SR, Hettie G, Darnall BD, Mackey SC. The impact of COVID-19 on patients with chronic pain seeking care at a tertiary pain clinic. *Scientific Reports*, 2022. doi:10.1038/s41598-022-10431-5

Gilam G, **Cramer EM**, Webber KA, Ziadni MS, Kao MC, Mackey SC. Classifying chronic pain using multidimensional pain-agnostic symptom assessments and clustering analysis. *Science Advances*, 2021. doi:10.1126/sciadv.abj0320

Mardian A, Perez L, Pun T, Cheung M, Porter J, De Bruyne K, Kao MC, Flood P, Moore N, Colloca L, **Cramer EM**, Ashton-James CE, Lorig K, Mackey SC, Darnall BD. Engagement in prescription opioid tapering research: The EMPOWER study and a coproduction model of success. *J General Internal Medicine*, 2021. doi:10.1007/s11606-021-07085-w

Hah JM, Nwaneshiudu CA, **Cramer EM**, Carroll IR, Curtin CM. Acute pain predictors of remote postoperative pain resolution after hand surgery. *Pain and Therapy*, 2021. doi:10.1007/s40122-021-00263-y

Scherrer KH, Ziadni MS, Kong JT, Sturgeon JA, Salmasi V, Hong J, **Cramer EM**, Chen AL, Pacht T, Olson G, Darnall BD, Kao MC, Mackey S. Development and validation of the Collaborative Health Outcomes Information Registry body map. *PAIN Reports*, 2021. doi:10.1097/pr9.0000000000000880

Cramer EM, Seneviratne M, Sharifi H, Ozturk A, Boussard T. Predicting the incidence of pressure ulcers in the ICU using machine learning. *eGEMS*, 2019. doi:10.5334/egems.307

Hah J, **Cramer EM**, Carroll I, Mackey S. Acute pain predictors of postoperative pain resolution, opioid cessation, and recovery: Secondary analysis of the START randomized clinical trial. *JAMA Network Open*, 2019. doi:10.1001/jamanetworkopen.2019.0168

Preprints

Carrillo-Perez F, **Cramer EM**, Pizurica M, Andor N, Gevaert O. Towards digital quantification of ploidy from pan-cancer digital pathology slides using deep learning. *bioRxiv*, 2024. doi:10.1101/2024.08.19.608555

Complete List of Published Work

<https://www.ncbi.nlm.nih.gov/myncbi/eric.cramer.1/bibliography/public/>

Conferences

Invited Talks

Cramer E, Perez L, Ashton-James C, Colloca L, Mardian A, Porter J, Moore N, De Bruyne K, Mackey S, Berna C, Ziadni M, Kao M, Stieg R, Darnall B. The association of the Stanford Expectations of Treatment Scale (SETS) with expectations on pain and opioid dose in a patient-centered prescription opioid tapering program. American Association of Pain Medicine Annual Conference, 2021.

Cramer EM, Heiser L, Chang YH. Mapping and controlling the progression of triple negative breast cancer using in silico modeling of the tumor microenvironment. OHSU Biomedical Engineering Department Retreat, Portland OR, 2025.

Abstracts

Johnson, J.I., Bergman, D.R., Lopez-Vidal T., **Cramer EM**, . . . , Fertig E.J. et al. Abstract A025: Genomics-informed agent-based models drive new understanding of the role of neoplastic phenotype transitions in human PDAC invasion. *Cancer Res* 85, A025 (2025). doi:10.1158/1538-7445.PANCREATIC25-A025

Sims Z, **Cramer EM**, Derrick D, Heiser L, Macklin P, Chang Y. Automated Rule Synthesis from Literature for Agent-Based Modeling of the Tumor Microenvironment. Proceedings of the AACR Special Conference in Cancer Research: Artificial Intelligence and Machine Learning. Special Conference in Cancer Research: Artificial Intelligence and Machine Learning; 2025 July 10; Montreal, QC, Canada. Philadelphia, PA: AACR Clin Cancer Res; c2025. doi:10.1158/1557-3265.AIMACHINE-A028

Cramer EM, Maisa Z, Scherre K, Mackey S. The somatic distribution of chronic pain and emotional distress utilizing the collaborative health outcomes information registry (CHOIR) bodymap. *The Journal of Pain*. American Pain Society/US Association for the Study of Pain Annual Meeting; 2018 March; Burbank, CA, United States. *The Journal of Pain*; c2018. doi: 10.1016/j.jpain.2017.12.128

Oral Presentations

Cramer EM, Macklin P, Heiser L, Chang YH. Controlling the progression of triple negative breast cancer using in silico modeling of the tumor microenvironment. Knight Cancer Institute Research Day, Portland OR, 2025.

Cramer EM, Macklin P, Heiser L, Chang YH. Mapping parameter space to emergent tumor microenvironment states in agent-based models. Society for Mathematical Biology Annual Meeting, Edmonton, Canada, 2025.

Cramer EM, Macklin P, Heiser L, Chang YH. Mapping parameter space to emergent tumor microenvironment states in agent-based models. OHSU MSTP Annual Retreat, Portland OR,

2025.

Cramer EM, Guin R, Wisdom E, Tang C. On the activities of the American Physician Scientists Association. APSA Western Regional Conference, Los Angeles CA, 2025.

Cramer EM, Helms H, Anderson A, Wong M, Bertassoni L, Chang YH. Optimization of a single cell bioprinting and agent-based modeling pipeline by spatiotemporal representation learning. SIAM Conference on the Life Sciences, Portland OR, 2024.

Cramer EM, Helms H, Anderson A, Wong M, Bertassoni L, Chang YH. A pipeline for integrating single cell bioprinting and agent-based modeling. OHSU BME Summer Seminar Series, Portland OR, 2024.

Cramer EM, Tang C, Waldman A. About the American Physician Scientists Association. MD-PhD National Student Conference, Copper CO, 2023.

Poster Presentations

Cramer EM. Mapping tissue samples to emergent tumor microenvironment states in agent-based models. MathOnco Conference, St. Pete Beach FL, 2025.

Cramer EM. Exploring tumor microenvironment states by simulating different conditions in an agent-based model. Gordon Research Conference on the Physical Science of Cancer, Pomona CA, 2025.

Cramer EM, Helms H, Anderson A, Wong M, Bertassoni L, Chang YH. Refining systems simulations with an iterative single cell bioprinting and agent-based modeling pipeline. AAP/ASCI/APSA Joint Meeting, Chicago IL, 2024.

Cramer EM, Helms H, Anderson A, Wong M, Bertassoni L, Chang YH. A pipeline for iteratively refining agent-based models. Integrated Mathematical Oncology Workshop, Moffitt Cancer Center, Tampa FL, 2023.

Cramer EM, Sims Z, Heussner R, Chang YH. Speedy histological-to-immunofluorescent translation (SHIFT) enables tumor marker prediction in breast cancer using deep learning. Single-cell Spatial Analysis of Cancer Symposium, Portland OR, 2023.

Perez L, **Cramer EM**, Ashton-James C, Colloca L, Mardian A, Porter J, Moore N, De Bruyne K, Mackey SC, Berna C, Ziadni MS, Kao MC, Stieg RL, Darnall BD. Patient choice and readiness to taper are associated with early satisfaction with clinician in a patient-centered prescription opioid tapering program. Patient-Centered Outcomes Research Institute (PCORI) Annual Meeting, 2020.

Cramer EM, Perez L, Ziadni M, Mackey S, Kao M, Darnall B. The association of the Stanford Expectations of Treatment Scale (SETS) with expectations on pain and opioid dose in a patient-centered prescription opioid tapering program. American Association of Pain Medicine Annual Meeting. 2021 April.

Cramer EM, Scherrer K, Ziadni M, Mackey S. Predicting CRPS limb affectation from patient psychosocial and physical factors. American Psychological Association Convention, 2018. **Divisional Award Winner.**

Cramer EM, Ziadni M, Scherrer K, Mackey S. The somatic distribution of chronic pain and emotional distress utilizing the CHOIR BodyMap. American Pain Society Convention, 2018.

Cramer EM, Mackey S, Carroll I, Hah J. Predicting remote pain and opioid use cessation using early trajectory clustering. Stanford Bio-X Symposium & Stanford Research Conference, 2016.

Awards

- OHSU FLAME Award (2026)
 - Excellence in Research (Nominee)
 - Advancement in Community Engagement (Nominee)
- OHSU Cancer Research Education and Training (CRTEC) Grant Writer’s Workshop Scholarship (2026)
- Frohnmayer Hicks Sciarretta Cancer Research Scholars Program Travel Award (2025)
- Human Tumor Atlas Network Travel Award (2024)
- OHSU Integrated Cancer Systems Biology Program T32 (2024-2026)
- APSA & ASCI Joint Meeting Travel Award (2024)
- Quantitative Systems Biology Program Award (2023)
- Integrated Mathematical Oncology Workshop Deluxe Travel Award (2023)
- OHSU Medical Scientist Training Program T32 (2021-2024)
- American Psychological Association Outstanding Poster Presentation (2018)
- Stanford University Award of Excellence (2017)
- Stanford Bio-X Undergraduate Research Fellowship (2016)

Teaching Experience

- Teaching Assistant, PSI Summer Coding Class, OHSU, Portland OR, Course Instructor: Dr. Daniel Zimmerman (2024, 2025)
- Lecture, *How to use Anki for Medical School*, OHSU, Portland OR (2023, 2024)

Academic Service

Peer Review

Ad hoc reviewer for *JAMA Network Open* and *PLOS Computational Biology*

Committees

- Admissions Committee, Student Member, OHSU MD-PhD Program (2024–2026)
- Student Admissions Liaison, OHSU MD-PhD Program (2023–2024)

Conference Organization

- [IN PROGRESS] Western Regional Meeting for the American Physician-Scientists Association (APSA) (April 4, 2026)

Student Organizations

- Co-Lead, OHSU Computation in Medicine Student Interest Group (2021–Present)
- Co-Lead, OHSU Physician-Scientists Student Interest Group (2021–Present)
- Co-lead, OHSU Triathlon Student Interest Group (2023-present)
- Web Operations Committee Co-Chair, American Physician-Scientists Association (APSA) (2023–2025)

Training and Workshops

Human Tumor Atlas Network (HTAN) Data Jamboree November 2024
National Cancer Institute, Bethesda, MD

Integrated Mathematical Oncology Workshop October–November 2023
Moffitt Cancer Center, Tampa, FL
Week-long intensive on mathematical modeling for steering cancer evolution through therapeutic intervention

PhysiCell Workshop August 2023
Indiana University (Virtual)
NCI-funded workshop on building multiscale agent-based multicellular simulations

OHSU Mentorship Academy “Mentoring Up” 2024
Modules on navigating mentoring relationships and career progression

Summer Institute Certificate in Data Analysis June–July 2017
University of Washington, Seattle, WA
Two-week intensive on reproducible research with biomedical big data

Professional Memberships

- Sigma Xi Scientific Research Honor Society (Full Member)
- Society for Mathematical Biology
- Society for Industrial and Applied Mathematics
- American Physician Scientist Association
- Biomedical Engineering Society
- Oregon Medical Association
- American Medical Association

Outreach and Volunteering

- **Partnership for Scientific Inquiry (PSI):** Annual presentations on ethical use of AI to high school students from underserved communities; serve as year-long mentor (2023–Present)
 - Students Mentored: Renee Liu, Isabella Baldiserri, Madison Lightfoot
- **Stanford Undergraduate Admissions:** Volunteer alumni interviewer (2018-present)

References

Available upon request