Roshan Kern

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EDUCATION

Massachusetts Institute of Technology | Cambridge, MA — Aug 2026 ~ 2030
Ph.D. in Biological Engineering (Computational Focus)
Accepted for 2025 cohort, deferred for personal reasons

Case Western Reserve University, College of Arts and Sciences | Cleveland, OH — Sep 2021 - Dec 2024
B.S. in Systems Biology (Bioinformatics Subspecialty)
Minors in Applied Data Science, Computer Science, Business Management
GPA 4.0

PUBLICATIONS

3. Di Bernardo, M., **Kern, R.**, Mallar, A., Nutter-Upham, A., Blainey, P.C., Cheeseman, I. (2025) BrieFlow: An integrated computational pipeline for high-throughput analysis of optical pooled screening data. ***Nature Communications (in review)***: doi.org/10.1101/2025.05.26.656231

2. Serrano, E., Chandrasekaran, S.N., Bunten, D., Brewer, K.I., Tomkinson, J., **Kern, R.**, Bornholdt, M., Fleming, S., Pei, R., Arevalo, J., Tsang, H., Rubinetti, V., Tromans-Coia, C., Becker, T., Weisbart, E., Bunne, C., Kalinin, A.A., Senft, R., Taylor, S.J., Jamali, N., Adeboye, A., Abbasi, H.S., Goodman, A., Caicedo, J.C., Carpenter, A.E., Cimini, B.A., Singh, S., Way, G.P. (2024) Reproducible image-based profiling with Pycytominer. ***Nat Methods***: doi.org/10.1038/s41592-025-02611-8

1. Tomkinson, J.*, **Kern, R.***, Mattson, C., Way, G.P. (2024) Toward generalizable single-cell phenotype prediction from nucleus morphology representations. ***BMC Methods***: doi.org/10.1186/s44330-024-00014-3, **Co-first authors*

RESEARCH EXPERIENCE

Massachusetts Institute of Technology | Cambridge, MA — Sep 2024 - Present
Research Intern
Advisor: Iain Cheeseman

- Co-founded computational team to make the lab cross-functional, implementing policies for project management, code review, and computational workflows.
- Developed Brieflow for processing optical pooled screen data at scale with a focus on modularity/extensibility for effective process development.
- Reduced screening time by 80% (5→1 day) and module integration time by 93% (2 weeks→1 day)

Fibrolytix Bio | Denver, CO — Jun 2025 - Aug 2025
CTO

- Co-founded drug discovery company aiming to use proprietary SOTA assay in lab-in-the-loop agentic system
- Developed agent for predicting efficacy of compound for reversing cardiac fibrosis with DSPy
- Reduced agent run cost by 50%

Recursion Pharmaceuticals | Salt Lake City, UT — May 2024 - Aug 2024
Data Science Intern
Mentor: Kyle Hansen

- Established metric for and optimized gene target selection from large-scale gene-chemical interactions.
- Investigated contribution of embeddings from three phenomic maps to compound selection process.

Case Western Reserve University | Cleveland, OH May 2023 - Aug 2023
Summer Undergraduate Research Program Fellow
Advisor: Thomas LaFramboise

- Implemented pipeline for human-endogenous retrovirus profiling from patient transcriptomics data.
- Investigated effect of human-endogenous retrovirus expression on bone marrow failure syndromes.

University of Colorado Anschutz | Aurora, CO May 2022 - May 2023
Research Intern
Advisor: Gregory Way

- Trained generalizable machine learning model for classification of single-cell images into one of 16 stages with phenotype features.
- Achieved F1 score of 0.877 on test set and applied model to different cell image datasets to understand generalizability.
- Developed cell image processing tool for extracting features from single-cell images (see projects).

MAJOR RESEARCH PRODUCTS

Compound Prioritization Agent: Prioritize compounds for screening in SOTA cardiac fibrosis-reversal screen using previous assay results. (github.com/FibrolytixBio/cf-compound-selection-demo)

BrieFlow: Open source, extensible tool for processing data from Optical Pooled Screens. (github.com/cheeseman-lab/brieflow)

PyCytominer: Open source suite of common functions used to process high dimensional readouts from high-throughput cell experiments. (github.com/cytomining/pycytominer)

IDR Stream: Open source software to handle cell image downloading, preprocessing, cell segmentation, feature extraction, feature compilation for Image Data Resource datasets. (github.com/WayScience/IDR_stream)

HONORS AND FELLOWSHIPS

2024 Case Alumni Association Junior Senior Scholar
2024 Dean's High Honors List, Case Western Reserve University
2023 Cancer-focused Summer Undergraduate Research Fellow, Case Western Reserve University

PRESENTATIONS AND TEACHING

CWRU CanSUR Symposium: "Human Endogenous Retrovirus Landscape of Aplastic Anemia", *August 2023*

Way Lab: Led lab discussions of self-supervised machine learning for live cell imagery segmentation (Robitaille et al., 2022) and the development of a dynamic protein atlas of human cell division (Cai et al., 2018).

Recursion Pharmaceuticals: Presented work on gene and compound selection processes to senior data scientists at data analysis reviews.

URS: Mentored undergraduate computational biology students in their research with an emphasis on effective communication with biologists.

COMMUNITY

Campus Flavor | Cleveland, OH Jan 2023 - May 2023
Project Leader/Coordinator

- Led two technical developers to create a website for collecting university-specific merchandise designs.
- Received 32 student-created designs in two weeks of hosting competition on the website.
- Communicated with business representatives from API company and university to formulate business strategy.

Saturday Tutoring Program | Cleveland, OH Jan 2023 - May 2023

Middle School Tutor

- Tutored middle school students in STEM topics including biology, chemistry, and physics.

Animal Protective League | Cleveland, OH Sep 2023 - Dec 2023

Dog Walker

- Walked and played with dogs at APL animal shelter.

MedWish | Cleveland, OH Jan 2022 - May 2023

Member

- Organized and inventoried donated medical supplies for distribution to areas in need.
- Led eight novice programmers in building a club website to attract new members.