

Rowan Callahan

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PhD, Biomedical Engineering

Oregon Health & Science University
Defended June 2026 • Degree expected fall 2026
Advisor: Thuy Ngo

BS, Bioengineering

Cornell University • 2014–2018

Research experience

- **PhD Researcher**, Center for Early Detection Advanced Research (Ngo Lab) Fall 2020–2026
 - Thesis: *Computational Methods for Resolving Contamination and Global Shifts in Cell-Free and Bulk RNA Sequencing*.
 - Led work on novel computational method GLORB for differential expression testing using Bayesian inference in NumPyro/JAX.
 - Co-first author on Nature Communications paper demonstrating cancer prediction using cell-free RNA
 - Designed and implemented Snakemake pipelines processing terabytes of NGS data from hundreds of cell-free RNA samples
- **Research Assistant**, Maxson Lab, Oregon Health & Science University January 2020–Fall 2020
 - Created comprehensive Snakemake pipeline for ATAC-seq data analysis processing hundreds of samples
 - Performed statistical analysis and data visualization using R/ggplot2 for leukemia progression studies
 - Co-authored multiple papers investigating molecular mechanisms of cancer progression in leukemia
- **Laboratory Technician**, Brito Lab, Cornell University Summer 2018–Summer 2019
 - Developed Snakemake pipelines for large-scale genomic analysis of thousands of microbial genomes from GenBank
 - Conducted statistical analysis of microbiome datasets investigating disease associations
 - Contributed to publications on microbiome roles in arthritis and disease response

Software

- **glorb-seq** — Bayesian RNA-seq normalization under global expression shifts (JAX/NumPyro).
pypi.org/project/glorb-seq • github.com/rowancallahan/GLORB-seq

Technical skills

- **Languages**: Python, R, Julia, bash
- **Modeling**: Bayesian inference (JAX/NumPyro, Pyro), PyTorch, probabilistic graphical models, machine learning
- **Bioinformatics**: RNA-seq, cell-free RNA, ATAC-seq; Snakemake pipelines at scale
- **Compute**: GPU training (NVIDIA/CUDA) with PyTorch and JAX; Slurm/HPC clusters
- **Tooling**: pandas, tidyverse; Linux administration, environment management, reproducible workflows

Leadership and service

- **External Vice President**, Biomedical Engineering Society, OHSU 2023–2024
- **Mentor**, Undergraduate Summer Research Program, OHSU Summer 2024
 - Supervised undergraduate research on cell-free RNA normalization; mentee presented a poster.

Publications

*Denotes equal contribution

Callahan, Rowan L., Stephen D. Coleman, and Thuy T. M. Ngo (Sept. 2026). “GLORB: Robust Bayesian inference for differential expression under global expression shifts”. In: *bioRxiv*. Preprint. DOI: [10.64898/2026.08.28.747928](https://doi.org/10.64898/2026.08.28.747928). URL: <https://doi.org/10.64898/2026.08.28.747928>.

- Moore, Travis W*, Spiliotopoulos, Elias*, Callahan, Rowan L.***, C Ward Kirschbaum, Conner F Bailey, Hyun Ji Kim, Breeshey Roskams-Hieter, Florian Goncalves, Dove Keith, Aaron J Grossberg, et al. (2025). "Cell free RNA detection of pancreatic cancer in pre diagnostic high risk and symptomatic patients". In: *Nature Communications* 16.1, p. 7345.
- Braun, Theodore P, Joseph Estabrook, Zachary Schonrock, Brittany M Curtiss, Lucie Darmusey, Jommel Macaraeg, Trevor Enright, Cody Coblentz, **Rowan L. Callahan**, William Yashar, et al. (2023). "Asx1 deletion disrupts MYC and RNA polymerase II function in granulocyte progenitors". In: *Leukemia* 37.2, pp. 478–487.
- Carratt, Sarah A, Garth L Kong, Cody Coblentz, Zachary Schonrock, Lauren Maloney, Ben Weeder, Will Yashar, **Rowan L. Callahan**, Hunter Blaylock, Colin Coleman, et al. (2023). "RUNX1:: ETO translocations must precede CSF3R mutations to promote acute myeloid leukemia development". In: *Leukemia* 37.5, pp. 1141–1146.
- Roskams-Hieter, Breeshey, Hyun Ji Kim, Pavana Anur, Josiah T Wagner, **Rowan L. Callahan**, Elias Spiliotopoulos, Charles Ward Kirschbaum, Fehmi Civitci, Paul T Spellman, Reid F Thompson, et al. (2022). "Plasma cell-free RNA profiling distinguishes cancers from pre-malignant conditions in solid and hematologic malignancies". In: *NPJ precision oncology* 6.1, p. 28.
- Porras, Ana Maria, Qiaojuan Shi, Hao Zhou, **Rowan L. Callahan**, Gabriella Montenegro-Bethancourt, Noel Solomons, and Ilana Lauren Brito (2021). "Geographic differences in gut microbiota composition impact susceptibility to enteric infection". In: *Cell Reports* 36.4.
- Braun, Theodore P, Cody Coblentz, Brittany M Curtiss, Daniel J Coleman, Zachary Schonrock, Sarah A Carratt, **Rowan L. Callahan**, Breanna Maniaci, Brian J Druker, and Julia E Maxson (2020). "Combined inhibition of JAK/STAT pathway and lysine-specific demethylase 1 as a therapeutic strategy in CSF3R/CEBPA mutant acute myeloid leukemia". In: *Proceedings of the National Academy of Sciences* 117.24, pp. 13670–13679.
- Coleman, Daniel J, Brittany M Smith, Cody Coblentz, **Rowan L. Callahan**, Jake VanCampen, Garth L Kong, Brian J Druker, Julia E Maxson, and Theodore P Braun (2020). "FLT3 and LSD1 Inhibitor Combinations Synergistically Repress Growth of FLT3-Mutant Acute Myeloid Leukemia Via Blockage of MYC Function". In: *Blood* 136, pp. 31–32.
- Guss, Jason D, Sophia N Ziemian, Marysol Luna, Taylor N Sandoval, Derek T Holyoak, Gabriel G Guisado, Sebastian Roubert, **Rowan L. Callahan**, Ilana L Brito, Marjolein CH van der Meulen, et al. (2019). "The effects of metabolic syndrome, obesity, and the gut microbiome on load-induced osteoarthritis". In: *Osteoarthritis and cartilage* 27.1, pp. 129–139.
- Hernandez, Christopher J, Xu Yang, Gang Ji, Yingzhen Niu, Arvinth S Sethuraman, Joseph Koressel, Matthew Shirley, Michael W Fields, Susan Chyou, Thomas M Li, Marysol Luna, **Rowan L. Callahan**, F Patrick Ross, Theresa T Lu, Ilana L Brito, Alberto V Carli, and Mathias PG Bostrom (2019). "Disruption of the gut microbiome increases the risk of periprosthetic joint infection in mice". In: *Clinical Orthopaedics and Related Research*® 477.11, pp. 2588–2598.