

Sarah Ennis, PhD

PHD RESEARCHER · GENOMICS DATA SCIENCE

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Summary

- Recent PhD graduate based in **Kingston, Ontario**
- Completed my PhD in **bioinformatics** at the University of Galway in Ireland
- Extensive experience analyzing a wide range of genomics assays, specializing in **single-cell** methods
- Passionate about **open science** and reproducibility, with a keen interest in **data visualization**

Skills

- Analysis of NGS data, particularly single-cell RNA and ATAC-seq data
- Extensive experience coding in R and Python
- Knowledge of HPC and cloud computing environments
- Development of R packages (included in *Bioconductor*) and R Shiny apps
- Experience with containerisation (Docker, Singularity) and workflow management (Nextflow)
- Strong knowledge of cancer biology and immunology

Education

PhD. in Genomics Data Science

Galway, Ireland

UNIVERSITY OF GALWAY

Sept. 2019 - Dec. 2023

- **Research project:** 'Single-cell characterization of the bone marrow microenvironment and its contribution to acute myeloid leukemia'. This research was conducted at the University of Galway under the supervision of Dr Eva Szegezdi and Dr Pilib Ó Broin.
- **Summary:** Recently completed my PhD focused on using single-cell RNA-seq data to identify novel drug targets in AML. During my PhD I became an expert in many commonly used packages for analyzing single-cell data, including Seurat and scanpy and also tools for pipeline development and containerisation. I also gained expertise developing R shiny apps and R packages.

MSc. in Biomedical Genomics

Galway, Ireland

UNIVERSITY OF GALWAY

Sept. 2018 - July 2019

- **Subjects studied:** Genomics Data Analysis, Probabilistic Models for Molecular Biology, Data Visualization, Cancer Genomics, Statistical Computing with R, Programming for Biology
- **Research project:** 'Characterizing transcriptional variation between tissue-resident macrophage subsets using single-cell RNA-seq'. I was awarded a scholarship to conduct this project at the Wellcome Sanger Institute in Cambridge, UK.
- **Final Grade:** 1.1

BSc. in Human Health & Disease

Dublin, Ireland

TRINITY COLLEGE DUBLIN

Sept. 2013 - May 2017

- **Subjects studied:** Cell Structure and Function, Fundamental and Applied Immunology, Signal Transduction and Gene Regulation, Neuroscience, Developmental Biology, Anatomy and Physiology, Research Design and Statistics
- **Research project:** 'Identification of biomarkers for the biological characterization and diagnosis of Rett Syndrome'. This project was conducted under the supervision of Dr Daniela Tropea
- **Final Grade:** 2.1

Experience

Visiting Researcher

Berlin, Germany

MAX DELBRÜCK CENTRE

Oct. - Dec. 2022

- As part of my PhD I completed a three month placement in the lab of Dr Simon Haas at the Berlin Institute for Medical Systems Biology.
- During this placement, I applied RNA velocity methods to characterize heterogeneity in the differentiation potential of hematopoietic stem cell clones.

Visiting Researcher

Cambridge, UK

WELLCOME SANGER INSTITUTE

May - July 2019

- My MSc research project '*Characterizing transcriptional variation between tissue-resident macrophage subsets using single-cell RNA-Seq*' was conducted at the Wellcome Sanger Institute under the supervision of Dr Daniel Gaffney, Dr Sarah Teichmann and Dr Pilib Ó Broin.
- Here, I conducted an analysis of scRNA-seq data from the Human Cell Atlas consortium to characterize tissue-specific macrophages.

R&D Scientist

Dublin, Ireland

AIRMID HEALTHGROUP, LTD.

May 2016 - Sept. 2018

- Worked in the R&D lab for a contract research organization, mainly on the development of a novel ELISA assay
- Conducted a week-long field study in the US
- Gained experience in working in an ISO17025-accredited laboratory
- Responsible for maintaining the R&D quality control system
- Fed and maintained *Cimex lectularius* (bed bug) colonies
- Gained experience in many wet-lab skills

Positions of responsibility

- One of two student representatives for my PhD cohort, which involved planning events and liaising with the program managers if any students had issues (2019-2023).
- I was also a student representative on the Executive Management Committee for my PhD program, which involved going to regular management meetings and contributing a student's perspective to any decisions being made (2019-2022).
- In May 2022 I founded a monthly Single-Cell Journal Club for single-cell researchers in Ireland.
- In December 2020, I was a member of the organizing committee for a successful student-run virtual symposium on Computational Genomics and Systems Biology.
- I designed and delivered a short online data visualization workshop as part of a *Data Science for Life Scientists* course during the pandemic.
- I have plenty of experience teaching and have been giving tutorials and delivering workshops in genomics data science and single-cell transcriptomics to MSc and PhD students since 2019.

Selected publications and presentations

- *Cell-cell interactome of the hematopoietic niche and its changes in acute myeloid leukemia*. S. Ennis, A. Conforte, E. O'Reilly, J. S. Takanlu, T. Cichocka, S. P. Dhami, P. Nicholson, P. Krebs, P. Ó Broin and E. Szegezdi. iScience, 2023, doi: 10.1016/j.isci.2023.106943.
- *CCPlotR: An R package for the visualisation of cell-cell interactions*. S. Ennis, P. Ó Broin and E. Szegezdi. Bioinformatics Advances, 2023, doi: 10.1093/bioadv/vbad130.
- *Epigenomic profiling at genome scale: from assays and analysis to clinical insights*. S. Ennis, B. Digby, and P. Ó Broin. Chapter 8 - Epigenetic Cancer Therapy (Second Edition) Translational Epigenetics., S. G. Gray, ed. (Academic Press), 2023, doi: 10.1016/B978-0-323-91367-6.00001-5.
- *Recurrent transcriptomic alterations associated with drug resistance and relapse in acute myeloid leukemia*. Invited oral presentation at the Young European Hematology Association meeting in Frankfurt, June 2023.
- *Single-cell analysis of the bone marrow microenvironment during AML progression*. Winner of Best Talk Award at the Computational Genomics and Systems Biology symposium December, 2020.

Hobbies and interests

- Crochet is a hobby I picked up during the pandemic, which I've stuck with ever since. I really enjoy making clothes, accessories, stuffed animals and gifts.
- I used to be an avid gymnast and only recently gave up coaching gymnastics to young children. I now do yoga regularly to keep up my flexibility.
- I also really enjoy data visualization as a hobby and regularly make plots for fun (link).
- In the same vein, I also consider genomics a hobby. I had my own genome sequenced a few years ago and even coded up an R Shiny app (called *Sarah-Seq*) to play with the data and make visualizations.