

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 analysing a wide range of genomics assays, specialising in **single-cell** methods
- Passionate about **open science** and reproducibility, with a keen interest in **data visualisation**

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 characterisation of the bone marrow microenvironment and its contribution to acute myeloid leukemia'*. This research was conducted at 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 analysing 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 Visualisation, Cancer Genomics, Statistical Computing with R, Programming for Biology
- **Research project:** *'Characterising 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 characterisation 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 characterise heterogeneity in the differentiation potential of hematopoietic stem cell clones.

Visiting Researcher

Cambridge, UK

WELLCOME SANGER INSTITUTE

May - July 2019

- My MSc research project '*Characterising 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 characterise tissue-specific macrophages.

R&D Scientist

Dublin, Ireland

AIRIMID HEALTHGROUP, LTD.

May 2016 - Sept. 2018

- Worked in the R&D lab for a contract research organisation, mainly on the development of a novel ELISA assay
- Conducted a week-long field study in the US
- Gained experience in working in an ISO 17025 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 organising committee for a successful student-run virtual symposium on Computational Genomics and Systems Biology
- I designed and delivered a short online data visualisation 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 visualisation 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 visualisations.