



# Conor M. Finlay

SENIOR RESEARCH FELLOW

Trinity Translational Medicines Institute, Trinity College Dublin

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Cellular Immunologist with bioinformatics experience

## Research interests

Cellular Immunologist with three core skills: *in vivo* **models of inflammation, bioinformatics and clinical research**. My main research interest is in what factors control mononuclear phagocyte (macrophage) differentiation during inflammation on a single cell level and how this impacts on disease outcomes. I have expertise T cell function, autoimmunity, type 2 immune responses, stromal-immune cell interactions, myeloid cells, data visualisation and programming.

## Current Roles

SENIOR RESEARCH FELLOW, TRINITY COLLEGE DUBLIN

- COVID19 Science Foundation Ireland-funded strategic partnership.
- Chairing the development of a new core facility service in single cell RNA-sequencing ("TCD Single Cell")
- Trinity Kidney Health Centre, lab management and clinical research.

HONORARY RESEARCH FELLOW, UNIVERSITY OF MANCHESTER

- Co-managing MRC programme grant with Prof. Judith Allen includes bi-monthly visits and weekly online meetings
- Collaborations with Judith Allen, Mark Travis and Matthew Hepworth groups (providing bioinformatics analysis)

## Employment History

### Research Fellow

Trinity College Dublin

SUPERVISOR: PROF MARK LITTLE

2021

- Lead single cell RNA-sequencing for COVID19 strategic partnership. Laboratory management of Trinity Kidney Health Centre (THKC). Clinical data analysis: incorporating data from clinical datasets (RedCap) with biobank datasets to stratify patients and stitch results with new analytes for future analysis using machine learning. Management of research assistant and PhD students in THKC.

### Research Associate

University of Manchester

SUPERVISOR: PROF JUDITH ALLEN.

2017-2021

- Origin, heterogeneity, proliferation and effector function of macrophages during helminth infection and type 2 immune responses. Funding: Medical Research Council/Wellcome Trust. See recent preprint for outputs.

### Lecturer (teaching relief)

Trinity College Dublin

SCHOOL OF BIOCHEMISTRY AND IMMUNOLOGY

2016-2017

- Performed the teaching duties for a senior professor on sabbatical for 1 year. Duties included undergraduate practice supervision, undergraduate and MSc teaching via lectures and tutorials, setting examinations and corrections with associated administration duties.

### Post-doctoral Researcher

Trinity College Dublin

SUPERVISOR: PROF KINGSTON HG MILLS.

2013-2016

- Research projects: 1. IP-protected translational project identifying and testing novel helminth-derived proteins as therapeutics for inflammatory disease. 2. Role of mast cells in the alternative activation of macrophages via IL-33. 3. Circadian regulation of autoimmune disease

### Pharmaceutical advertisement and event reviewer

Bristol-Myers Squibb

PAID INTERNSHIP

2007

- Reviewed pharmaceutical advertisements for assessment of compliance. Created and managed database for reporting issues and producing analysis documents. Liaising with marketing and scientific teams to address and solve issues.

## Education

### Informatics Training Scheme (Wellcome Trust TPA)

University of Manchester

PROGRAMMING AND COMPUTATIONAL APPROACHES TO BIOLOGY MODULES

2020

- Constituted 50% of taught component of MSc Bioinformatics and Systems Biology

### PhD in Immunology

Trinity College Dublin

IMMUNE MODULATION BY THE HELMINTH PARASITE FASCIOLA HEPATICA

2013

- Supervisor: Kingston Mills

### BA(Mod) in Natural Sciences

Trinity College Dublin

MAJOR: BIOCHEMISTRY WITH IMMUNOLOGY

2007

- Grade: 1:1, graduated top of class

## Publications

1. Finlay, C. M., Parkinson, J. E., Chan, B. H. K., Ajendra, J., Chenery, A., Morrison, A., Houlder, E., Baker, S. M., Dickie, B., Boon, L., MacDonald, A., Konkel, J. E., Ruckerl, D., & Allen, J. E. (2021). Genotype and Th2 Cells Control Monocyte to Tissue Resident Macrophage Differentiation During Nematode Infection of the Pleural Cavity. *bioRxiv*, 2021.12.17.472661. <https://doi.org/10.2139/ssrn.3992680>
2. Fiancette, R., Finlay, C. M., Willis, C., Bevington, S. L., Soley, J., Ng, S. T. H., Baker, S. M., Andrews, S., Hepworth, M. R., & Withers, D. R. (2021). Reciprocal transcription factor networks govern tissue-resident ILC3 subset function and identity. *Nature Immunology*, 22(10), 1245–1255. <https://doi.org/10.1038/s41590-021-01024-x>
3. Cunningham, K. T., Finlay, C. M., & Mills, K. H. G. (2021). Helminth Imprinting of Hematopoietic Stem Cells Sustains Anti-Inflammatory Trained Innate Immunity That Attenuates Autoimmune Disease. *The Journal of Immunology*, 206(7), 1618–1630. <https://doi.org/10.4049/jimmunol.2001225>
4. Finlay, C. M., Cunningham, K. T., Doyle, B., & Mills, K. H. G. (2020). IL-33–Stimulated Murine Mast Cells Polarize Alternatively Activated Macrophages, Which Suppress T Cells That Mediate Experimental Autoimmune Encephalomyelitis. *The Journal of Immunology*, 205(7), 1909–1919. <https://doi.org/10.4049/jimmunol.1901321>
5. Finlay, C. M., & Allen, J. E. (2020). The immune response of inbred laboratory mice to *Litomosoides sigmodontis*: A route to discovery in myeloid cell biology. *Parasite Immunology*, 42(7), e12708. <https://doi.org/10.1111/pim.12708>
6. Czajkowska, B. I., Finlay, C. M., Jones, G., & Brown, T. A. (2019). Diversity of a cytokinin dehydrogenase gene in wild and cultivated barley. *PLOS ONE*, 14(12), e0225899. <https://doi.org/10.1371/journal.pone.0225899>
7. McEntee, C. P., Finlay, C. M., & Lavelle, E. C. (2019). Divergent Roles for the IL-1 Family in Gastrointestinal Homeostasis and Inflammation. *Frontiers in Immunology*, 10. <https://doi.org/10.3389/fimmu.2019.01266>
8. Campbell, S. M., Knipper, J. A., Ruckerl, D., Finlay, C. M., Logan, N., Minutti, C. M., Mack, M., Jenkins, S. J., Taylor, M. D., & Allen, J. E. (2018). Myeloid cell recruitment versus local proliferation differentiates susceptibility from resistance to filarial infection. *eLife*, 7, e30947. <https://doi.org/10.7554/eLife.30947>
9. Sutton, C. E., Finlay, C. M., Raverdeau, M., Early, J. O., DeCoursey, J., Zaslon, Z., O'Neill, L. A. J., Mills, K. H. G., & Curtis, A. M. (2017). Loss of the molecular clock in myeloid cells exacerbates T cell-mediated CNS autoimmune disease. *Nature Communications*, 8(1), 1923. <https://doi.org/10.1038/s41467-017-02111-0>
10. Finlay, C. M., Stefanska, A. M., Coleman, M. M., Jahns, H., Cassidy, J. P., McLoughlin, R. M., & Mills, K. H. G. (2017). Secreted products of *Fasciola hepatica* inhibit the induction of T cell responses that mediate allergy. *Parasite Immunology*, 39(10), e12460. <https://doi.org/10.1111/pim.12460>
11. Finlay, C. M., Stefanska, A. M., Walsh, K. P., Kelly, P. J., Boon, L., Lavelle, E. C., Walsh, P. T., & Mills, K. H. G. (2016). Helminth Products Protect against Autoimmunity via Innate Type 2 Cytokines IL-5 and IL-33, Which Promote Eosinophilia. *The Journal of Immunology*, 196(2), 703–714. <https://doi.org/10.4049/jimmunol.1501820>
12. Bernard, N. J., Finlay, C. M., Tannahill, G. M., Cassidy, J. P., O'Neill, L. A., & Mills, K. H. (2015). A critical role for the TLR signaling adapter Mal in alveolar macrophage-mediated protection against *Bordetella pertussis*. *Mucosal Immunology*, 8(5), 982–992. <https://doi.org/10.1038/mi.2014.125>
13. Finlay, C. M., Walsh, K. P., & Mills, K. H. G. (2014). Induction of regulatory cells by helminth parasites: exploitation for the treatment of inflammatory diseases. *Immunological Reviews*, 259(1), 206–230. <https://doi.org/10.1111/imr.12164>
14. Coleman, M. M., Finlay, C. M., Moran, B., Keane, J., Dunne, P. J., & Mills, K. H. G. (2012). The immunoregulatory role of CD4 + FoxP3 + CD25 - regulatory T cells in lungs of mice infected with *Bordetella pertussis*. *FEMS Immunology & Medical Microbiology*, 64(3), 413–424. <https://doi.org/10.1111/j.1574-695X.2011.00927.x>
15. Walsh, K. P., Brady, M. T., Finlay, C. M., Boon, L., & Mills, K. H. G. (2009). Infection with a Helminth Parasite Attenuates Autoimmunity through TGF- $\beta$ -Mediated Suppression of Th17 and Th1 Responses. *The Journal of Immunology*, 183(3), 1577–1586. <https://doi.org/10.4049/jimmunol.0803803>

### UNPUBLISHED MANUSCRIPTS IN PREPARATION

Finlay, C.M. Parkinson, J.P., Chan, B.H.K. and Allen, J.E. Contribution of tissue resident macrophages to the proteome of the pleural fluid (running title)

O'Conluain, R., Hollingsworth, s., Little, M. and Finlay, C.M., Soluble urokinase plasminogen activator receptor is a biomarker of kidney disease in ANCA-associated vasculitis (running title)

Dwivedi, A., Ui Mhaonaigh, A., Carrol, M. Finlay, C.M. and Little, M. Characterisation of low density neutrophils in SARS-Cov 2 patients (running title)

## Funding

### MR/V011235/1 Programme Grant

Medical Research Council

2.26 MILLION GBP CO-INVESTIGATOR (2 APPLICANTS)

2021

- “Macrophages in type 2 immunity: unravelling susceptibility and resistance to tissue nematode infection”. Funded, 2.26 million GBP. Co-wrote grant and provided scientific design and all preliminary data. I was awarded an honorary research fellow position at UoM to facilitate ongoing involvement in this project when I left Manchester to return to Ireland.

### Building Engagements in Health Research Scheme

Internal TCD

10K EUR, CO-APPLICANT

2021

- Co-Applicant as scientific lead with Jennifer Scott (TCD, ICAT fellow) as medical lead. ‘Nanoparticle modulation of neutrophil and monocyte responses to ANCA’

## Skills

**Animal models of Disease:** 12 years experience in in vivo model design: Autoimmunity (Experimental autoimmune encephalomyelitis, DSS-colitis, Imiquimod-induced inflammation), Cancer (B16 melanoma, CT26 lung), Infection (*L. sigmodontis*, *B. pertussis*, *F. hepatica*), Allergy (Allergen airway hypersensitivity) and general in vivo manipulation (Cell transfers, Irradiation/bone marrow transplantation peritonitis models, circadian rhythm modulation, cytokine administration, intraplural injections).

**Laboratory techniques:** Expert in cell culture, cell sorting (BD Machines), high parameter (20+) flow cytometry, mass cytometry (including panel design), tissue digestion, ELISA, lab management, inventory, ordering, health and safety.

**Molecular biology** NGS library preparation (Illumina) for single cell RNA-sequencing (BD Rhapsody and 10X genomics), study design for NGS experiments, RNA extraction, RT-qPCR, nucleic acid QC (TapeStation, Qubit), PCR. Label free quantitative proteomics, bulk RNA-seq and ATAC-seq library preparation, enzyme assays.

**Clinical research:** Cell isolation from blood (Whole blood, granulocytes/neutrophils, PBMC), biobanking, clinical database management (RedCap). Patient stratification, data curating and multi-modal integration: data analysis of longitudinal clinical datasets with 100s of clinical fields and 10000s of patients. Writing reports in RMarkdown to be read by clinicians and scientists.

**Programming, Data analysis, Statistics & Visualisation:** R (Fluent, 5 years), Python (Intermediate, 3 years), RMarkdown (Intermediate, 3 years) Unix/Bash (Beginner). Data analysis/visualisation in and in R. Other programs: FlowJo and Prism, Adobe Illustrator, biostatistics and its application to experimental design and interpretation. Database creation and maintenance. R Shiny Apps. high-performance computing (basic).

**Bioinformatics** Expert in summarising take-home messages from single cell RNA-sequencing analysis in R and python (4 years experience). Mass cytometry analysis (FLOCore, Spectre). Analysis of microarray/bulk RNA-seq datasets analysis in R (limma, DESeq2). Pathway analysis (IPA, GO), regulatory network analysis (SCENIC), trajectory inference (Slingshot, RNA velocity), clustering (hierarchical and graph-based methods), dimension reduction (UMAP, t-SNE, PCA, PAC-map), basic experience with machine learning (non linear, random forest) and systems biology (graphs, networks, logical modelling and differential equations).

## Presentations & awards

### ORAL

2022	Trinity Translational Medicine Institute - Conference 2022	TTMI, Dublin
2021	Cytokine and interferon society meeting	Cardiff
2019	Irish Society of Immunology	RCSI, Dublin
2019	BSI Type 2 Immunology Meeting	Manchester
2019	KU Leuven, UZ Gasthuisberg Campus	KU Leuven
2015	Molecular and cellular biology of helminth parasites IX	Hydra, Greece
2015	TBSI Post-Doc Research Day	TCD, Dublin
2015	1st TBSI-Weimann joint Immunology conference	Rehovot, Israel
2015	European Congress of Immunology	Vienna
2009	European Congress of Immunology	Berlin

### POSTER

2019	British Society of Immunology	Liverpool
2018	Type 2 Immunity in Homeostasis and Disease	Bruges
2017	British Society of Immunology	Brighton
2016	British Society of Immunology	Liverpool
2015	Frontiers in neurology	TCD, Dublin
2014	Cytokine and interferon society meeting	Melbourne
2012	Keystone: Biology of Cytokines	Colorado
2011	Cytokine and interferon society meeting	Florence

### AWARDS

- 2022 Wiley Top Cited Article Award - Parasite Immunology
- 2019 Best presentation from selected abstracts - Irish Society of Immunology
- 2015 Visiting student training scheme - Weizmann Institute of Science
- 2015 TBSI Post-Doc Research Day - Runner up talk prize
- 2014 Milstein Travel Award - International Cytokine society
- 2007 Valdicotrian - Biochemistry with Immunology degree
- 2007 Best Undergraduate Research Poster Prize - School of Biochemistry and Immunology

## Teaching & Supervision

### LECTURING

2021	R programming, data visualisation and transcriptomic analysis (3 workshops)	<i>MSc in Immunology</i>
2016-2017	T cell differentiation, effector function and regulation (4 lectures)	<i>BA(Mod)</i>
2016-2017	Cancer immunology and immunotherapy (2 lectures)	<i>BA(Mod)</i>
2016-2017	EAE as a model for multiple sclerosis	<i>BA(Mod)</i>
2016-2017	T cell differentiation, effector function and regulation (2 lectures)	<i>MSc in Immunology</i>
2014-2017	Introduction to parasite and type 2 Immune responses (3 lectures)	<i>MSc in Immunology</i>

**Other teaching related duties** Undergraduate practical supervision, tutorials, and organising visits of school students as various points between 2013-2016. Introduction to data scientists for immunologists course ([click here](#)). Official 'external mentor' of a PhD student in Wellcome Trust in Immunomatrix in Complex Disease PhD program in Manchester. Assessor for the PhD continuation viva (2022). Interview panel for Post-doctoral researcher (2022) and research assistant (2021).

### SUPERVISION

<b>3 month student project</b>	<i>Trinity College Dublin</i>
BACHELOR IN MEDICINE	2022
• Primary supervisor	
<b>2 week student project</b>	<i>Trinity College Dublin</i>
BACHELOR IN MEDICINE	2021-2022
• Lab/statistical training. Continued Informal mentorship with one student.	
<b>3 month student project</b>	<i>Trinity College Dublin</i>
BA(MOD)	2021
• Co-primary supervisor – lab/statistical training, writing mentorship. Ongoing collaboration with a co-first author paper in preparation together.	
<b>Formal supervision</b>	<i>Trinity College Dublin</i>
RESEARCH ASSISTANT	2021
• Direct supervision and training. Daily interaction.	
<b>6 month student project</b>	<i>University of Manchester</i>
MRES INFECTION BIOLOGY	2020-2021
• Co-primary supervisor - project design and mentorship & direct supervision/training, student now in UK graduate Industry role.	
<b>6 month student project</b>	<i>University of Manchester</i>
MRES INFECTION BIOLOGY	2018-2019
• Co-primary supervisor - project design and mentorship & direct supervision/training, student now a PhD Candidate in Leeds.	
<b>Informal mentorship</b>	<i>Trinity College Dublin</i>
PHD	2017-2021
• Informal supervisor. Project design and management and career mentorship. Two papers published together, awarded best presentation at ICS 2018. Now a Post-Doc in Glasgow.	
<b>3 month student project</b>	<i>Trinity College Dublin</i>
MSC IMMUNOLOGY	2016
• Co-primary supervisor - project design and mentorship & direct supervision/training. Student now a PhD candidate in TCD.	
<b>Informal mentorship</b>	<i>Trinity College Dublin</i>
PHD	2015-2017
• Informal supervisor. Project design and management.	
<b>3 month student project</b>	<i>Trinity College Dublin</i>
MSC IMMUNOLOGY	2015
• Co-primary supervisor - project design and mentorship & direct supervision/training. Project led to IRC-funded PhD that I co-wrote.	
<b>3 month student project</b>	<i>Trinity College Dublin</i>
MSC IMMUNOLOGY	2014
• Co-primary supervisor - project design and mentorship & direct supervision/training. Student now in Biotech Industry role.	

## Outreach and organisation

**Discover Research Night**, Dublin Sep 2014. Marie Skłodowska-Curie-funded. I was the event organiser responsible for public engagement at Trinity Biomedical Sciences Institute, 8 weeks' full-time.

**10th International Symposium on Bordetella**, Sep 2013. Logistics manager responsible for operations of the conference including registration, AV equipment and support for speakers.

**Manchester Immunology Group Seminar Series**, May 2017 – Sep 2018. Co-lead organiser. Handling invitations, hospitality, communications, for renowned international speakers to visit University of Manchester.

**School talk**, Oaklands Community College, Edenderry Co. Offaly, 2021. “The life of a scientist”.

**Single Cell TCD Core facility**. I formed a working group in 2021 to address the competitive disadvantage of not having a working single cell RNA-sequencing in TCD. The service was soft launched internally in 2022 on a cost-for-service basis and delivers a full pipeline from consultation, cellular isolation, library preparation, sequencing, bioinformatics and basic downstream analysis. I am to expand this to a full service and hire talent to expand the capability of this service to include external industry clients.

## Referees

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### **Prof Judi Allen**

PROFESSOR OF IMMUNOBIOLOGY; JUDI.ALLEN@MANCHESTER.AC.UK

*University of Manchester*

*Lydia Becker Institute*

### **Dr Matthew Hepworth**

SIR HENRY DALE FELLOW; MATTHEW.HEPWORTH@MANCHESTER.AC.UK

*University of Manchester*

*Lydia Becker Institute*

### **Prof Kingston HG Mills**

PROFESSOR OF EXPERIMENTAL IMMUNOLOGY; KINGSTON.MILLS@TCD.IE

*Trinity College Dublin*

*School of Biochemistry and Immunology*

### **Prof Cliona O’Farrelly**

PROFESSOR OF COMPARATIVE IMMUNOLOGY; OFARRECL@TCD.IE

*Trinity College Dublin*

*School of Biochemistry and Immunology*

# Appendix

## SHORTLISTED APPLICATIONS

- Shortlisted for UKRI Innovation/Rutherford Fund Skills Development Fellowship (Computational Biology), 2017.
- Shortlisted as candidate from school of medicine for Science Foundation Ireland Pathways programme, 2021
- Shortlisted for academic-industry partnership with Janssen Pharmaceuticals, Belgium, 2019

## REVIEWING

2022	Frontiers in Immunology	Article review
2021	French National Research Agency (ANR) 2021 generic call	Grant review
2021	BBSRC Discovery Fellows award	Grant review
2018	Scientific Reports	Article review
2017-2020	Parasite Immunology	Article review

## TRAINING

2018	Single Cell RNA-sequencing	Earlham Institute
2017	Home Office personal animal licence	Manchester
2014	Fluorescent activated cell sorting	UCD

## COURSES

### UNIVERSITY OF MANCHESTER

- Data Protection
- Introduction to High Performance Computing
- Introduction to version control using Git
- Introduction to the UNIX shell
- Programming with Python
- Data analysis using R
- Introduction to Python

### TRINITY COLLEGE DUBLIN

- Biological safety workshop
- Cryogenics safety workshop
- Radiological safety workshop
- LAST animal handling course (2009)
- Data Protection and Health Research (2021)
- Project Management

## SOCIETIES AND COMMITTEES

### SOCIETY MEMBERSHIP

- British Society of immunology
- Irish Society of Immunology
- International Cytokine & Interferon Society

### COLLEGE COMMITTEES

- STTAR Data Committee (COVID SPP)
- Single Cell TCD core facility working group (Chair)
- Financial services end user committee
- TCD advocacy group for the improvement of core facilities (Chair, in formation)

## CITATION METRICS

