



# Conor M. Finlay

## SENIOR RESEARCH FELLOW

Trinity Translational Medicines Institute, Trinity College Dublin

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Cellular immunologist & bioinformatician

## 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 and how this impacts on disease outcomes. I have expertise T cell function, autoimmunity, type 2 immune responses, stromal-immune cell interactions and myeloid cells.

## 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. Project management,

### 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., Chan, B. H. K., Ajendra, J., Chenery, A., Morrison, A., Houlder, E. L., Baker, S. M., Dickie, B., Boon, L., MacDonald, A. S., Konkel, J. E., Rückerl, 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/10.1101/2021.12.17.472661>
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., Parkinson, J., Chan, B. H. K., Ajendra, J., Chenery, A., Morrison, A., Houlder, E. L., Baker, S. M., Dickie, B., Boon, L., MacDonald, A. S., Konkel, J. E., Rückerl, 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/10.1101/2021.12.17.472661>
5. 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>
6. 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>
7. 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>
8. 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>
9. 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>
10. Sutton, C. E., Finlay, C. M., Raverdeau, M., Early, J. O., DeCoursey, J., Zaslona, 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>
11. 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>
12. 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>
13. 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>
14. 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>
15. 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>
16. 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>

### 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

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

## 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:** Expert in design and execution of animal experiments. Models include: Experimental autoimmune encephalomyelitis, *L. sigmodontis* infection, airway hypersensitivity, colitis, circadian rhythm modulation, B16 melanoma, peritonitis models, cytokine administration, *F. hepatica* infection, *B. pertussis* infection.

**Laboratory techniques:** *In vitro* Expert in cell culture and preparation of cells for downstream analysis with particular expertise in single cell technologies. Skills include: cell sorting, high parameter (20+) flow cytometry, mass cytometry (including panel design), tissue digestion, ELISA, enzyme assays, RT-qPCR, confocal microscopy, Amnis Image Stream.

**Clinical research:** Preparation of cells from human blood. Biobanking, clinical database management. Patient stratification and statistical analysis. Working in as part of a multi-disciplinary scientific-clinical research team. Data curating and 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), Python (Intermediate), RMarkdown (Intermediate) Unix/Bash (Beginner). Data analysis/visualisation in and in R. Other programs: FlowJo and Prism, Adobe Illustrator, Strong background in statistics and its application to experimental design and interpretation of results. Database creation and maintenance. Creation of Shiny Apps. high-performance computing.

**Bioinformatics.** Library preparation and QC for Next Generation Sequencing. Major interest in analysis of single cell RNA-sequencing datasets in R and python (3 years experience). Mass cytometry analysis. Analysis of microarray/bulk RNA-seq datasets analysis in R. Pathway analysis, regulatory network analysis, clustering, dimension reduction etc.

## Presentations & awards

### ORAL

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

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

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## LECTURING

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

*MSc in Immunology*  
*BA(Mod)*  
*BA(Mod)*  
*BA(Mod)*  
*MSc in Immunology*  
*MSc in Immunology*

Other duties include Undergraduate practical supervision, tutorials, and organising visits of school students as various points between 2013-2016. Introduction to data scientists for immunologists course available here. Acting as an official 'external mentor' of a PhD student in Wellcome Trust in Immunomatrix in Complex Disease PhD program in Manchester.

## SUPERVISION

### 2 week student project

*Trinity College Dublin*

#### BACHELOR IN MEDICINE

2021-2022

- Lab/statistical training. Continued Informal mentorship with one student.

### 3 month student project

*Trinity College Dublin*

#### BA(Mod)

2021

- Co-primary supervisor – lab/statistical training, writing mentorship. Ongoing collaboration with a co-first author paper in preparation together.

### Formal supervision

*Trinity College Dublin*

#### RESEARCH ASSISTANT

2021

- Direct supervision and training. Daily interaction.

### 6 month student project

*University of Manchester*

#### MRES INFECTION BIOLOGY

2020-2021

- Co-primary supervisor - project design and mentorship & direct supervision/training, student now in UK graduate Industry role.

### 6 month student project

*University of Manchester*

#### MRES INFECTION BIOLOGY

2018-2019

- Co-primary supervisor - project design and mentorship & direct supervision/training, student now a PhD Candidate in Leeds.

### Informal mentorship

*Trinity College Dublin*

#### 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.

### 3 month student project

*Trinity College Dublin*

#### MSC IMMUNOLOGY

2016

- Co-primary supervisor - project design and mentorship & direct supervision/training. Student now a PhD candidate in TCD.

### Informal mentorship

*Trinity College Dublin*

#### PHD

2015-2017

- Informal supervisor. Project design and management.

### 3 month student project

*Trinity College Dublin*

#### MSC IMMUNOLOGY

2015

- Co-primary supervisor - project design and mentorship & direct supervision/training. Project led to IRC-funded PhD that I co-wrote.

### 3 month student project

*Trinity College Dublin*

#### MSC IMMUNOLOGY

2014

- Co-primary supervisor - project design and mentorship & direct supervision/training. Student now in Biotech Industry role.

# Outreach and organisation

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**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 in Trinity college dublin to address the competitive disadvantage of not having a working single cell RNA-sequencing. My aim is to deliver a single cell RNA-seq service to TCD researchers on a cost per service basis that will act as a platform to develop a full core facility service.

## Referees

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### **Prof Judi Allen**

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

### **Dr Matthew Hepworth**

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

### **Prof Kingston HG Mills**

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

### **Prof Cliona O'Farrelly**

PROFESSOR OF COMPARATIVE IMMUNOLOGY; OFARRECL@TCD.IE

*University of Manchester*

*Lydia Becker Institute*

*University of Manchester*

*Lydia Becker Institute*

*Trinity College Dublin*

*School of Biochemistry and Immunology*

*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	<a href="#">Article review</a>
2021	French National Research Agency (ANR) 2021 generic call	<a href="#">Grant review</a>
2021	BBSRC Discovery Fellows award	<a href="#">Grant review</a>
2018	Scientific Reports	<a href="#">Article review</a>
2017-2020	Parasite Immunology	<a href="#">Article review</a>

## TRAINING

2018	Single Cell RNA-sequencing	<a href="#">Earlham Institute</a>
2017	Home Office personal animal licence	<a href="#">Manchester</a>
2014	Fluorescent activated cell sorting	<a href="#">UCD</a>

## 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)

## 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)

## CITATIONS

