

JACK GISBY

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EDUCATION

Imperial College London

August 2020 – July 2023

PhD Candidate

- Thesis: Using Multi-Omics to Understand COVID-19, supervised by Dr James Peters.

University of Birmingham

September 2016 – June 2020

Biochemistry with Professional Placement (MSci) - First Class

- Dissertation: A Prior Knowledge-Based Computational Workflow for *de novo* Structural Elucidation of Small Molecules in Mass Spectrometry Metabolomics, supervised by Dr Ralf Weber.

RESEARCH EXPERIENCE

PhD Research

August 2020 – July 2023

Immunology and Inflammation, Imperial College London

- Integrated proteomic, transcriptomic and genetic data to investigate the pathology of COVID-19.
- Applied longitudinal models, network analyses and machine learning to high-dimensional datasets.
- Used causal inference and fine-mapping techniques to identify genetic variants that cause disease.
- Used and developed Nextflow & HPC-based pipelines to process sequence and variant data.
- Disseminated research findings through peer-reviewed publications and conference presentations.

Research volunteer

July 2019 – June 2020

School of Biosciences, University of Birmingham

- Developed an R/Bioconductor package for [annotating rare transposons in genome sequences](#) 🌐.
- Mined genome sequence data to uncover the impact of DNA transposons on the evolution of host genes.

MSci Research

October 2019 – May 2020

School of Biosciences, University of Birmingham

- Developed a [Python package for improved annotation of LC-MS metabolomics spectra](#) 🌐.
- Created a [deep learning-based anomaly detection model](#) 🌐 that classifies molecular structures.
- Adhered to software engineering best practices, including version control and automated testing.

Industrial placement

August 2018 – July 2019

The Binding Site, Birmingham

- Took responsibility for the timely delivery of assay development projects and statistical reports.
- Communicated with, and delivered presentations to, a wide variety of interdisciplinary staff.

TEACHING EXPERIENCE

Graduate Teaching Assistant

December 2022 - January 2023

Immunology MSc Programme, Imperial College London

- Aided in the development and delivery of a series of "Introduction to R programming" workshops.

Lecturing

September 2021 – December 2022

Molecular Epidemiology MSc Module, Imperial College London

- Developed and delivered lectures for RNA sequencing in the context of investigating genetic variation.
- Set homework and reading, in addition to final exam questions and marking schemes.

Graduate Teaching Assistant

May 2022 – August 2022

Research Computing, Imperial College London

- Developed a [parallelised pipeline for processing RNA-seq data](#)  using Docker and Nextflow.
- Created teaching materials demonstrating best practices for building data pipelines.

Mentoring

July 2021 – August 2022

Immunology and Inflammation, Imperial College London

- Co-supervised an undergraduate research project utilising proteomics to investigate Lupus.

SKILLS

Languages	Proficient in Python, R, Bash, SQL, exposure to C++, Julia
Tools	Git/GitHub, Docker, Conda, Nextflow, Airflow, L ^A T _E X
Compute	High performance computing clusters, Google Cloud Platform
Data	Transcriptomics (bulk and single cell RNA-seq), proteomics (Olink/SomaLogic assays), genomics (sequences and variants), metabolomics (LC-MS), clinical data
Statistics	Linear & mixed models, joint models, Mendelian randomisation & fine mapping, supervised learning (caret, scikit-learn, pytorch), network analysis (WGCNA)
Software	Package development (R, Python), containerisation (Docker, Singularity), continuous integration (unittest, testthat), version control (Git, GitHub)

SELECTED PUBLICATIONS

- **Jack S. Gisby[†]**, Norzawani B. Buang[†], Artemis Papadaki, Candice L. Clarke, Talat H. Malik, Nicholas Medjeral-Thomas, Damiola Pinheiro, Paige M. Mortimer, Shanice Lewis, Eleanor Sandhu, Stephen P. McAdoo, Maria F. Prendecki, Michelle Willicombe, Matthew C. Pickering, Marina Botto, David C. Thomas[†], James E. Peters[†]. **Multi-omics identify falling LRRC15 as a COVID-19 severity marker and persistent pro-thrombotic signals in convalescence.** *Nature Communications* 2022. [10.1038/s41467-022-35454-4](https://doi.org/10.1038/s41467-022-35454-4)
- **Gisby JS**, Catoni M. **The widespread nature of Pack-TYPE transposons reveals their importance for plant genome evolution.** *PLOS Genetics* 2022. [10.1371/journal.pgen.1010078](https://doi.org/10.1371/journal.pgen.1010078)
- Klaric L[†], **Gisby JS[†]**, Papadaki A[†], Muckian MD, Macdonald-Dunlop E, Zhao JH, Tokolyi A, Persyn E, Pairo-Castineira E, Morris AP, Kalnapienkis A, Richmond A, Landini A, Hedman K, Prins B, Zanetti D, Wheeler E, Kooperberg C, Yao C, Petrie JR, Fu J, Folkersen L, Walker M, Magnusson M, Eriksson N, Mattsson-Carlgren N, Timmers PRHJ, Hwang SJ, Enroth S, Gustafsson S, Vosa U, Chen Y, Siegbahn A, Reiner A, Johansson , Thorand B, Gigante B, Hayward C, Herder C, Gieger C, Langenberg C, Levy D, Zhernakova DV, Smith JG, Campbell H, Sundstrom J, Danesh J, Michalsson K, Suhre K, Lind L, Wallentin L, Padyukov L, Landn M, Wareham NJ, Gteson A, Hansson O, Eriksson P, Strawbridge RJ, Assimes TL, Esko T, Gyllenstein U, Baillie JK, Paul DS, Joshi PK, Butterworth AS, Mlarstig A, Pirastu N, Wilson JF[†], Peters JE[†]. **Mendelian randomisation identifies alternative splicing of the FAS death receptor as a mediator of severe COVID-19.** *medRxiv* 2021. [2021.04.01.21254789](https://doi.org/10.21254/medrxiv.2021.04.01.21254789)
- **Jack S. Gisby[†]**, Candice L Clarke[†], Nicholas Medjeral-Thomas[†], Talat H Malik, Artemis Papadaki, Paige M Mortimer, Norzawani B Buang, Shanice Lewis, Marie Pereira, Frederic Toulza, Ester Fagnano, Marie-Anne Mawhin, Emma E Dutton, Lunnathaya Tapeng, Arianne C Richard, Paul DW Kirk, Jacques Behmoaras, Eleanor Sandhu, Stephen P McAdoo, Maria F Prendecki, Matthew C Pickering, Marina Botto, Michelle Willicombe[†], David C Thomas[†], James E Peters[†]. **Longitudinal proteomic profiling of dialysis patients with COVID-19 reveals markers of severity and predictors of death.** *eLife* 2021. [10:e64827](https://doi.org/10.7554/eLife.64827)

[†]Equal contributions

CONFERENCES AND PRESENTATIONS

- **Rising Scientist Day 2022 (Poster)** - Multi-omics identify LRR15 as a COVID-19 severity predictor and persistent pro-thrombotic signals in convalescence
- **Biomarkers of the Future 2021 (Presentation)** - Longitudinal proteomic profiling of dialysis patients with COVID-19 reveals markers of severity and predictors of death
- **HUPO Reconnect 2021 (Poster)** - Longitudinal proteomic profiling of dialysis patients with COVID-19 reveals markers of severity and predictors of death
- **UK-CIC Immunology 2021 (Poster)** - Longitudinal proteomic profiling of dialysis patients with COVID-19 reveals markers of severity and predictors of death
- **Longitudinal Studies 2021, Wellcome Genome Campus (Presentation)** - Longitudinal proteomic profiling of dialysis patients with COVID-19 reveals markers of severity and predictors of death

ADDITIONAL COURSES

- "From large datasets to biological insight" by Wellcome Connecting Science & EMBL-EBI
- "FAIR in (Biological) Practice" by University of Edinburgh (Ed-DaSH)
- "Data Science workflows with Nextflow" by University of Edinburgh (Ed-DaSH)
- "Introduction to Assessment and Feedback" by Imperial College London Graduate School
- "Introduction to Teaching and Learning" by Imperial College London Graduate School
- "Profiling and optimisation in Python" by Imperial College London Research Computing
- "Deep Learning in the Life Sciences" by MITx
- "Software Development with C++" by University of Birmingham Research Computing

REFERENCES

Dr James Peters (PhD Supervisor)
Clinical Reader in Rheumatology
Faculty of Medicine
Imperial College London
Hammersmith
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Dr Marco Catoni (Undergraduate Project)
Lecturer in Plant Biology
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