ALISTAIR BAILEY

An engineer by training, I have since worked primarily as an informatician and research scientist. I currently work as a learning technologist supporting Librarians at the University of Southampton.[1]

The topic of my research career has been the role of HLA antigen processing and presentation in disease recognition by T cells. In cancer[2] this has focused on HLA-presented tumour antigens[3], and in infectious disease the focus has been HLA-presented viral[4] and bacterial antigens. Exploiting these targets has the potential for enhancing personalised therapies, vaccine development and understanding allergy.

I have contributed to research into COVID19[5], skin sensitization to chemical allergens[6], asthma[7] and contagious cancer in the Tasmanian Devil[8].

My core skills are processing and analysing data from whole exome sequencing, RNAseq, scRNAseq and proteomics assays. My workflow combines command line tools with micromamba, the R programming language and git version control.

Proteomics data I have curated, deposited and I am the data controller for is deposited at the PRoteomics IDEntifications Archive[9]. Whole Exome and RNAseq data I have curated, deposited and I am the data controller for is deposited at the European Genome-phenome Archive[10].

I am a Data and Software Carpentry[11] instructor and I have also created and delivered my own workshops to teach foundational R coding and data science skills[12] to bioscientists and web design[13] to librarians.

EDUCATION

2017 — **Carpentries Instructor**
Worldwide — The Carpentries

- I trained as a Carpentries[14] instructor as part of their volunteer led mission to increase global capacity in essential data and computational skills for conducting efficient, open, and reproducible research.

2016 — **Machine Learning**
Stanford University — Coursera

- 10 week online introduction to machine learning.

2015 — **Data Science Specialization**
John Hopkins University — Coursera

- 12 month online set of courses on data science using R, git and command line tools.

2013 | 2008 — **PhD, Immunology**
Cancer Sciences, University of Southampton — Southampton, UK

- Thesis: Relating the structure, function and dynamics of the MHC Class I antigen presenting molecule.

2008 | 2005 — **BEng, Civil Engineering**
University of Southampton — Southampton, UK

- First Class Honours in Civil Engineering.

View this CV online with links at *ab604.uk/cv/cv.html*

CONTACT

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LANGUAGE SKILLS

- R
- Bash
- Markdown
- Latex
- Git
- Python
- SQL

*Made with the R package **pagedown**.*

The source code is available on github.com/ab604/abailey-cv.

The font is Atkinson Hyperlegible

Last updated on 2024-08-15.

2005 | 2004

Engineering, Science & Mathematics Foundation Year

University of Southampton — Southampton, UK

- Maths and physics foundation year preparation for undergraduate study.

1994 | 1992

BTEC ND Audio-Visual Production

Bournemouth & Poole College of Art & Design — Bournemouth, UK

- Foundation course in film, photography, TV and radio production.

RESEARCH EXPERIENCE

2023

Research Fellow

School of Biological Sciences, University of Southampton — Southampton, UK

- scRNAseq analysis of T-cell response to neutrophil exposure. Bioinformatician maternity leave cover for Medical Research Council funded project.

2023 | 2018

Research Fellow

Centre for Proteomic Research/Cancer Sciences, University of Southampton — Southampton, UK

- Cancer Research UK Accelerator: this project aims to identify potential treatment targets for hard to treat cancers using multi-omics methods. In this project our focus was on oesophageal, lung and neuroendocrine cancers.

  As an informatician I processed, analysed and managed data from whole exome sequencing, RNAseq, scRNAseq and proteomics.

  For sequencing fastq data, my workflow comprised of a mixture of command line tools using bash scripts and R/RStudio. I followed the Broad Institute Best Practices for genomic data analysis[15] and Cornell Bioinformatics Core[16]. For proteomics data, my worklfow used Peaks Studio[17], and post-process in R and RStudio.

  Scripts and processed data were managed using git version control. Raw data was deposited along with processed outputs in PRoteomics IDEntifications Archive[18] and the European Phenome-Genome Archive[19].

We also developed our method to identify treatment targets for infectious diseases from influenza and bacterial proteins. In 2020 I also worked to develop a COVID19 test using proteomics methods.

2018 | 2015

Research Fellow

Centre for Proteomic Research/Cancer Sciences, University of Southampton — Southampton, UK

- Developed peptidomics methodology at the UoS for research into the role of MHC molecules in skin sensitisation to chemical allergy.

2015 | 2013

Research Fellow

Cancer Sciences, University of Southampton — Southampton, UK

- MRC Centenary Fellow

TEACHING EXPERIENCE

2024

Webpage Design[20]

University of Southampton — Southampton, UK

- I created a webpage design workshop and materials for Librarians at the University of Southampton

2022 | 2021

BIOL 2013: Introduction to bioinformatics

University of Southampton — Southampton, UK

- I taught the undegraduate introduction to bioinformatics module on variant discovery using the University Galaxy Server.

2020 | 2019

Coding Together[21]

University of Southampton — Southampton, UK

- I created and taught an eight week series of collaborative workshops to teach foundational R coding and data science skills based on Carpentries materials.

2019 | 2018

Academic Support Tutor

IntoUniversity Millbrook — Southampton, UK

- IntoUniversity[22] supports young people from disadvantaged backgrounds to attain either a university place or another chosen aspiration. I volunteered as an academic support tutor for secondary school learners.

2018

Software Carpentry

Umeå University — Umeå, Sweden

- Taught R for Reproducible Research and assisted in Command Line Basics.

2018

British Society for Proteomics 2018 Data Science Workshop[23]

University of Bradford — Bradford, UK

- I created and taught a proteomics data science workshop including introduction to R, Volcano plots, heatmaps and peptide logos.

2017

Data Carpentry

University of Southampton — Southampton, UK

- Taught R for Reproducible Research and assisted in Command Line Basics and git.

2017

Data Carpentry

University of Southampton — Southampton, UK

- Taught R for Reproducible Research and assisted in introduction to SQL.

2017

Software Carpentry

University of Southampton — Southampton, UK

- Assisted with python and git for reproducible research.

I enjoy teaching foundational coding and data science skills to researchers and developing evidence-based best practices. I am especially interested in helping novices and making coding more accessible to all.

RESEARCH DATA

Immunopeptidomic analysis of influenza A virus infected human tissues identifies internal proteins as a rich source of HLA ligands[24], Publicly released

- Proteomics data: PRIDE Project PXD022884[25]

Identification of neoantigens in esophageal adenocarcinoma[26], Publicly released

- Proteomics data: PRIDE Project ID PXD031108[27]
- WES & RNAseq data EGA Study ID EGAS00001005957

Characterization of the Class I MHC Peptidome Resulting From DNCB Exposure of HaCaT Cells[28], Publicly released

- Proteomics data: PRIDE Project PXD021373[29]

Neoantigen identification in pancreatic neuroendocrine tumours, Unreleased pending publication

- Proteomics data: PRIDE Project ID PXD037449
- WES & RNAseq data EGA Study ID EGAS00001006722

Immunopeptidomics guided identification of neoantigens in non-small cell lung cancer, Unreleased pending publication

- Proteomics data: PRIDE Project ID PXD028990
- WES & RNAseq data EGA Study ID EGAS00001005499

Immunopeptidomics of a brain tumour cell line to identify HLA presented Zika, Unreleased pending publication

- Proteomics data: PRIDE Project ID PXD037627

Non-small cell lung cancer global proteomics, Unreleased pending publication

- Proteomics data: PRIDE Project ID PXD054390

Oesophageal adenocarcinoma global proteomes, Unreleased pending publication

- Proteomics data: PRIDE Project ID PXD054428

INDUSTRY EXPERIENCE

I have worked in a variety of roles ranging from engineering to research scientist. I like collaborative environments where I can learn from my peers.

2012

Internship

Microsoft Research — Cambridge, UK

- Helped develop computational model of MHC I peptide selection.

2012 | 2004

Freelance Satellite Communications Engineer

Globecast — London, UK

- I continued to work as an engineer in broadcast TV from 2004 and 2012 on major events such as the Olympics and Football World Cup.

2004 | 2000

Satellite Communications Engineer

Globecast — London, UK

- Full time engineer working in global broadcast TV primarily on sports, news and live entertainment events.

2000 | 1995

Film and television post-production engineer

Telecine — London, UK

- I trained as an engineer to operate various TV & film post-production equipment.

PUBLICATIONS

2024

Proteogenomics guided identification of functional neoantigens in non-small cell lung cancer[30]

bioRxiv

- Ben Nicholas, Alistair Bailey, Katy J McCann, Oliver Wood, Eve Currall, Peter Johnson, Tim Elliott, Christian Ottensmeier, Paul Skipp

2022

Operation Moonshot: rapid translation of a SARS-CoV-2 targeted peptide immunoaffinity liquid chromatography-tandem mass spectrometry test from research into routine clinical use[31]

Clinical Chemistry and Laboratory Medicine

- Jenny Hällqvist, Benjamin I. Nicholas, Alistair Bailey et al.

2022

Identification of neoantigens in esophageal adenocarcinoma[32]

Immunology

- Ben Nicholas, Alistair Bailey, Katy J. McCann, Oliver Wood, Robert C. Walker, Robert Parker, Nicola Ternette, Tim Elliott, Tim J. Underwood, Peter Johnson, Paul Skipp

2022

Analysis of cell-specific peripheral blood biomarkers in severe allergic asthma identifies innate immune dysfunction[33]

Clinical & Experimental Allergy

- Ben Nicholas, Jane Guo, Hyun-Hee Lee, Alistair Bailey, Rene de Waal Malefyt, Milenko Cicmil, Ratko Djukanovic

2022

Immunopeptidomic analysis of influenza A virus infected human tissues identifies internal proteins as a rich source of HLA ligands[34]

PLoS Pathogens

- Ben Nicholas, Alistair Bailey, Karl J. Staples, Tom Wilkinson, Tim Elliott, Paul Skipp.

2021

The differentiation state of the Schwann cell progenitor drives phenotypic variation between two contagious cancers[35]

PLOS Pathogens

- Rachel S. Owen, Sri H. Ramarathinam, Alistair Bailey, Annalisa Gastaldello, Kathryn Hussey, Paul J. Skipp, Anthony W. Purcell, Hannah V. Siddle

2021

Characterization of the Class I MHC Peptidome Resulting From DNCB Exposure of HaCaT Cells[36]

Toxicological Sciences

- Alistair Bailey, Ben Nicholas, Rachel Darley, Erika Parkinson, Ying Teo, Maja Aleksic, Gavin Maxwell, Tim Elliott, Michael Ardern-Jones, Paul Skipp.

2021

The immunopeptidomes of two transmissible cancers and their host have a common, dominant peptide motif[37]

Immunology

- Annalisa Gastaldello, Sri H. Ramarathinam, Alistair Bailey, Rachel Owen, Steven Turner, N. Kontouli, Tim Elliott, Paul Skipp, Anthony W. Purcell, Hannah V. Siddle.

2019

Dynamically Driven Allostery in MHC Proteins: Peptide-Dependent Tuning of Class I MHC Global Flexibility[38]

Frontiers in Immunology

- Cory M. Ayres, Esam T. Abualrous, Alistair Bailey, Christian Abraham, Lance M. Hellman, Steven A. Corcelli, Frank Noé, Tim Elliott, Brian M. Baker.

2017

Direct evidence for conformational dynamics in major histocompatibility complex class I molecules[39]

JBC

- Andy van Hateren, Malcolm Anderson, Alistair Bailey, Jörn M. Werner, Paul Skipp, Tim Elliott.

2017

Recent advances in Major Histocompatibility Complex class I antigen presentation: Plastic MHC molecules and TAPBPR mediated quality control[40]

F1000 Research

- Andy van Hateren, Alistair Bailey, Tim Elliott.

2015

Selector function of MHC I molecules is determined by protein plasticity[41]

Scientific Reports

- Alistair Bailey, Neil Dalchau, Rachel Carter, Stephen Emmott, Andrew Phillips, Jörn M. Werner, Tim Elliott

2014

Two Polymorphisms Facilitate Differences in Plasticity between Two Chicken Major Histocompatibility Complex Class I Proteins[42]

PLoS One

- Alistair Bailey, Andy van Hateren, Tim Elliott, Jörn M. Werner.

2013

A Mechanistic Basis for the Co-evolution of Chicken Tapasin and Major Histocompatibility Complex Class I Proteins[43]

JBC

- Andy van Hateren, Rachel Carter, Alistair Bailey, Nasia Kontouli, Anthony P. Williams, Jim Kaufman, Tim Elliott.

2010

The cell biology of major histocompatibility complex class I assembly: towards a molecular understanding[44]

Tissue Antigens

- A. Van Hateren, E. James, A. Bailey, A. Phillips, N. Dalchau, T. Elliott

LINKS

1. https://www.soton.ac.uk
2. https://www.cancerresearchuk.org/funding-for-researchers/accelerator-award/portfolio-funded-projects-outputs
3. https://doi.org/10.1111/imm.13578
4. https://doi.org/10.1371/journal.ppat.1009894
5. https://doi.org/10.1515/cclm-2022-1000
6. https://doi.org/10.1093/toxsci/kfaa184
7. https://doi.org/10.1111/cea.14197
8. https://doi.org/10.1111/imm.13307
9. https://www.ebi.ac.uk/pride/
10. https://ega-archive.org/
11. https://carpentries.org/
12. https://ab604.github.io/docs/coding-together-2019/
13. https://ab604.github.io/webpage-design/
14. https://carpentries.org/
15. https://gatk.broadinstitute.org/hc/en-us
16. https://abc.med.cornell.edu/
17. https://www.bioinfor.com/peaks-studio/
18. https://www.ebi.ac.uk/pride/
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20. https://ab604.github.io/webpage-design/
21. https://ab604.github.io/docs/coding-together-2019/
22. https://intouniversity.org/
23. https://ab604.github.io/docs/bspr_workshop_2018/index.html
24. https://doi.org/10.1371/journal.ppat.1009894
25. https://www.ebi.ac.uk/pride/archive/projects/PXD022884
26. https://doi.org/10.1111/imm.13578
27. https://www.ebi.ac.uk/pride/archive/projects/PXD031108
28. https://doi.org/10.1093/toxsci/kfaa184

29. https://www.ebi.ac.uk/pride/archive/projects/PXD021373
30. https://doi.org/10.1101/2024.05.30.596609
31. https://doi.org/10.1515/cclm-2022-1000
32. https://doi.org/10.1111/imm.13578
33. https://doi.org/10.1111/cea.14197
34. https://doi.org/10.1371/journal.ppat.1009894
35. https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1010033
36. https://doi.org/10.1093/toxsci/kfaa184
37. https://doi.org/10.1111/imm.13307
38. https://doi.org/10.3389/fimmu.2019.00966
39. https://doi.org/10.1074/jbc.M117.809624
40. https://doi.org/10.12688/f1000research.10474.1
41. https://doi.org/10.1038/srep14928
42. https://doi.org/10.1371/journal.pone.0089657
43. https://doi.org/10.1074/jbc.M113.474031
44. https://doi.org/10.1111/j.1399-0039.2010.01550.x