Alistair Bailey

Research Fellow in Immunoproteomics
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Education

PhD (Cancer Science Unit), University of Southampton
BEng with First Class Honours in Civil Engineering, University of Southampton
Engineering, Science and Mathematics Foundation Year, University of Southampton
Machine Learning, Stanford Coursera
Data Science Specialization, John Hopkins University Coursera
BTEC ND Audio-Visual Production, Bournemouth & Poole College of Art & Design

Skills and tools

R (also bits of MATLAB, python and SQL).
GitHub, Markdown, LaTeX, shell scripting, Linux.
Precision medicine bioinformatics combining whole exome sequencing, RNA-seq and and proteomics analysis.
Experimental design and practice for cell culture proteomics workflow.
Teaching foundational coding skills as a Data and Software Carpentry instructor.
Writing and speaking for technical and general audiences.
Providing academic support for young people from disadvantaged backgrounds through the charity IntoUniversity.

Experience

Research Fellow, University of Southampton

January 2013 to present

I have been engaged in research in MHC class I antigen processing and presentation since 2008. My current project aims to understand the role of MHC class I molecules in skin sensitisation to chemical allergens. I also contribute to research into oesophageal and lung cancer in humans and contagious cancer in Tasmanian Devils.

My experimental workflow involves carrying out cell culture and immunopeptidomics mass spectrometry. I also have experience with hydrogen/deuterium exchange mass spectrometry, fluorescent spectroscopy of kinetic measurements, and molecular dynamics simulations.

My informatics workflow involves mutanome construction and neoantigen prediction from whole exome and transcriptome sequencing, and proteomics data. Proteomic analysis makes use of dedicated proteomics software Peaks and MaxQuant, and various bioinformatics tools including NetMHC. I have recently explored building a peptide classification model using Keras/Tensorflow.

Internship, Microsoft Research, Cambridge

March 2012 to June 2012

During my internship I assisted in the development of a mathematical model of peptide selection class I MHC molecules as part of a team of computational biologists.

Satellite Communications Engineer

May 1995 to August 2012

Prior to becoming a full-time scientist, I spent 17 years in the television industry working primarily as an engineer in satellite communications and control room operations up until 2012. This involved collaborating and communicating with a team of engineers, managers and customers on projects such as the London 2012 Olympics.

- Freelance Satellite Communications Engineer — October 2004 to September 2012
- Satellite Master Control Room Engineer, Globecast — March 2001 to October 2004
- Master Control Room Engineer, Telecine — May 1995 to November 1999
- Sound Recordist, Wrightstuff Productions — July 1994 to September 1994

Publications

In preparation

The processing and presentation of sensitiser modified peptides by keratinocytes. **A.Bailey**, B. Nicholas, G. Maxwell, P. Skipp, T. Elliott.
Investigating the specificity of haptenation by skin sensitisers Diphencyprone and Ethyl Acrylate. **A.Bailey**, E. Parkinson, , G. Maxwell, P. Skipp, M. Aleksic.
Neoepitope identification in oesophageal adenocarcinoma. B. Nicholas, **A.Bailey**, P. Skipp, T. Elliott, R. Walker, T. Underwood.
The peptidome of Tasmanin Devil facial tumour disease 1. A. Gastadello, **A.Bailey**, T. Elliott, H.V. Siddle.
The origins of devil facial tumour disease 2 in Tasmanian Devils. R. Owen, **A.Bailey**, A. Gastadello, T. Elliott, H.V. Siddle.

Published

Direct evidence for conformational dynamics in major histocompatibility complex class I molecules. A. van Hateren, M. Anderson, **A. Bailey**, J. M. Werner, P. Skipp, T. Elliott. Journal of Biological Chemistry, 2017. DOI: 10.1074/jbc.M117.809624
Recent advances in Major Histocompatibility Complex class I antigen presentation: Plastic MHC molecules and TAPBPR-mediated quality control. A. van Hateren, **A. Bailey**, T. Elliott. F1000 Research, 2017. DOI: 10.12688/f1000research.10474.1
Selector function of MHC I molecules is determined by protein plasticity. **A. Bailey**, N. Dalchau, R. Carter, S. Emmott, A. Phillips, J.M. Werner and T. Elliott Scientific Reports, 2015. DOI: 10.1038/srep14928
Two polymorphisms facilitate differences in plasticity between two chicken major histocompatibility complex class I proteins. **A. Bailey**, A. van Hateren, T. Elliott, J.M. Werner - PloS one, 2014. DOI: 10.1371/journal.pone.0089657
A mechanistic basis for the co-evolution of chicken tapasin and major histocompatibility complex class I (MHC I) proteins. A. van Hateren, R. Carter, **A. Bailey**, N. Kontouli, Williams, A. P. Kaufman, J. Elliott, T. Journal of Biological Chemistry, 2013. DOI: 10.1074/jbc.M113.474031
Relating the structure, function and dynamics of the MHC Class I antigen presenting molecule. **A.Bailey**, thesis dissertation, 2013, DOI: 10.6084/m9.figshare.1563649
The cell biology of major histocompatibility complex class I assembly: towards a molecular understanding. A. Van Hateren, E. James, **A. Bailey**, A. Phillips, Dalchau, N. Elliott, T. Tissue antigens, 2010. DOI: 10.1111/j.1399-0039.2010.01550.x