

# Alistair Bailey

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Research Fellow in Immunoproteomics

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## Education

PhD (Cancer Science Unit),  
BEng with First Class Honours in Civil Engineering,  
Engineering, Science and Mathematics Foundation Year,  
Machine Learning,  
Data Science Specialization,  
BTEC ND Audio-Visual Production,

University of Southampton  
University of Southampton  
University of Southampton  
Stanford Coursera  
John Hopkins University Coursera  
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. The project I currently work on aims to [improve immunotherapy treatment for cancer patients](#). I also contribute to research into the role of MHC molecules in skin sensitisation to chemical allergens, and contagious cancer in the [Tasmanian Devil](#). I am also a [Data and Software Carpentry](#) instructor.

My experimental experience includes 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

*Dynamically Driven Allostery in MHC Proteins: Peptide-Dependent Tuning of Class I MHC Global Flexibility* C. M. Ayres, E. T. Abualrous, **A. Bailey**, C. Abraham, L. M. Hellman, S. A. Corcelli, F. Noé, T. Elliott, B. M. Baker. Frontiers in Immunology, 2019. DOI: [10.3389/fimmu.2019.00966](https://doi.org/10.3389/fimmu.2019.00966)

*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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1111/j.1399-0039.2010.01550.x)