Dr. Steven J. Dunn

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Microbial Genomics and Antimicrobial Resistance

Summary

I am a scientific researcher with 8 years of experience in delivering high quality results in the fields of microbial genomics and antimicrobial resistance. My research interests surround the evolution and epidemiology of clinically relevant pathogens and their mobile genetic elements, and I am keen to develop a clinical research program.

Experience

- Postdoctoral Researcher — *University of Birmingham* 2017 - Present

  My work focussed on the evolutionary mechanisms underpinning AMR dissemination in *E. coli*. We introduced ESBL-naive strains to an ESBL plasmid, and looked at the genomic and transcriptomic impact of that plasmid aquisition both immediately and after many hundreds of generations. I also worked on a diverse array of side projects that produced impactful and internationally relevant outputs, as well as creating revenue for the University through the design and teaching of a CPD course.

- Consultant Bioinformatician — *Freelance* 2020 - Present

  I am available for external consultancy work, and have completed projects for large international organisations. I provide data curation, analysis and visualisation services for complex genomic datasets, facilitating the communication of key information in a clear and visually appealing way.

- COVID-19 Test Site Manager — *University of Birmingham* 2020 - 2021

  During the pandemic, I managed an asymptomatic testing facility. I helped to train and supervise testing staff, maintaining high standards of efficacy and efficiency. The site oversaw over 20,000 tests, and we produced research demonstrating the efficacy of lateral flow tests for detecting individuals with a high RT-qPCR value.

- COVID-19 Laboratory Technician — *Medicines Discovery Catapult* 2020 - 2021

  At the start of the UK's response to the pandemic, I worked on a temporary basis at one of the Pillar 2 Lighthouse laboratories. I helped to prepare public samples for RT-qPCR testing in a high throughput fashion, with care, efficiency and dilligence.

- PhD and Undergraduate Research — *Nottingham Trent University* 2010 - 2017

  Following a First Class degree, and strong undergraduate research project which earned the Yakult Prize for Microbiology, I embarked on a PhD studying the genomic epidemiology of *Campylobacter spp*. Through preparing, sequencing and analysing hundreds of clinical isolates, I honed many skills that serve me well today. I also gained experience in teaching undergraduate laboratory classes.

Relevant Skills

- Bioinformatics
- WGS (Illumina + ONT)
- RNA-Seq
- R + Python
- Teaching
- Visual Design
- Curriculum Design
- Management
- Commercialisation

Teaching and Citizenship

I lead the design and delivery of a week-long, paid CPD crash-course on microbial genomic data analysis, which is attended by a mix of postgraduate and independent researchers. I also support undergraduate teaching and supervise a range of undergraduate and postgraduate projects. I have peer reviewed papers in a variety of journals, including Microbial Genomics and The Journal for Antimicrobial Chemotherapy.

Publications

* - First Author

- Dunn SJ*, Carrilero L*, Brockhurst M, McNally, A. Strain-specific transcriptional responses to multidrug resistance plasmid acquisition within and between lineages of *Escherichia coli*. ***mSystems*** (2021).
- Kantele A*, Kuenzli E*, Dunn SJ*, *et al*. Real-time sampling of travelers shows intestinal colonization by multidrug-resistant bacteria to be a dynamic process with multiple transient acquisitions. ***The Lancet Microbe*** (2021).
- Ferguson J*, Dunn SJ*, *et al*. Validation testing to determine the sensitivity of lateral flow testing for asymptomatic SARS-CoV-2 detection in low prevalence settings: testing frequency and public health messaging is key. ***PLOS Biology*** (2021)
- Papakonstantinou D, Dunn SJ, *et al*. Mapping Gene-by-Gene Single-Nucleotide Variation in 8,535 *Mycobacterium tuberculosis* Genomes: a Resource To Support Potential Vaccine and Drug Development. ***mSphere*** (2021).
- Dunn SJ*, Connor C, Mcnally A. The evolution and transmission of multi-drug resistant *Escherichia coli* and *Klebsiella pneumoniae*: the complexity of clones and plasmids. ***Current Opinion in Microbiology*** (2019).
- Dunn SJ*, Pascoe B, Turton J, *et al*. Genomic epidemiology of clinical *Campylobacter spp*. at a single health trust site. ***Microbial Genomics*** (2018).
- Mcnally A, Oren Y, Kelly D, Pascoe B, Dunn SJ, *et al*. Combined Analysis of Variation in Core, Accessory and Regulatory Genome Regions Provides a Super-Resolution View into the Evolution of Bacterial Populations. ***PLoS Genetics*** (2016).
- Baig A, Mcnally A, Dunn SJ, Paszkiewicz KH, Corander J, Manning G. Genetic import and phenotype specific alleles associated with hyper-invasion in *Campylobacter jejuni*. ***BMC Genomics*** (2015).