

## Personal details

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I am a veterinary-qualified infectious disease researcher leading a [research team](#) (6 members) integrating microbial genomics, epidemiology and laboratory studies to identify and characterise drivers of disease and antimicrobial resistance emergence. I have extensive expertise and experience in microbial genomics and working with national and international public health agencies, vaccine developers, and governmental bodies across diverse geographical settings, including specific policy experience working with SAGE during the COVID-19 pandemic. I have a significant, diverse funding portfolio, an extensive collaborative network, a high quality and prolific publication record, participate in impact and knowledge exchange activities, deliver teaching and hold various internal and external leadership roles.

## Education and training

University of Melbourne, Australia Bachelor of Veterinary Science (2:1)	2003 – 2006
University of Cambridge, United Kingdom Doctorate of Philosophy	2008 – 2012
University of Liverpool, United Kingdom Certificate of Professional Studies in Teaching in Higher Education	2013 – 2016
Leadership training programs <i>Aurora: leaders in Higher Education (6 months), EMBO Laboratory Management for Group Leaders (4 days), SUSTAIN leadership (1 year)</i>	2017 – 2019
London School of Hygiene and Tropical Medicine, United Kingdom Masters in Epidemiology (MSc) Two modules complete	2019 – ongoing

## Experience

Clinical Veterinarian Emergency and Critical Care and Companion Animal work	2006 – 2008
Cambridge Infectious Diseases Consortium Junior Research Fellow University of Cambridge	2008 – 2010
Wellcome Trust Clinical Research Training Fellow University of Cambridge	2010 – 2013
Postdoctoral Research Fellow Wellcome Trust Sanger Institute <i>* Maternity leave Jul 2015 – Apr 2016</i>	2013 – 2016
Wellcome Trust Clinical Research Career Development Fellow Tenure Track Fellow	2016 – 2019

University of Liverpool  
\* Maternity leave Jan 2018 – Oct 2018

Expert Science Cell Adviser (Secondee) Mar – Aug 2020  
Scientific Advisory Group for Emergencies COVID19 response team  
Government Office for Science

Wellcome Trust Clinical Research Career Development Fellow 2019 – Present  
Senior Lecturer  
University of Liverpool

### Research grants (as principal investigator/research fellow)

Biotechnology and Biological Sciences Research Council <i>Convergent evolution of Enterobacteriaceae in epidemiological networks of high antimicrobial use</i>	£507,000	2021 –
Medical Research Council New Investigator Research Grant <i>Informing shigellosis treatment and management through pathogen genomics</i>	£313,610	2018 –
Academy of Medical Sciences Springboard award <i>Multi-species models of antimicrobial resistance emergence and persistence developed from real world epidemics</i>	£99,734	2017 –
Wellcome Trust Clinical Career Development Fellowship <i>Mathematical modelling frameworks for incorporating bacterial genomics into antimicrobial stewardship</i>	£305,729	2014 –
Wellcome Trust Clinical Research Training Fellowship <i>Evolutionary and transmission dynamics of henipavirus infection in the African straw-coloured fruit bat</i>	£263,000	2010-2013

### Selected Research grants (as co-investigator)

Bill and Melinda Gates Foundation <i>Enterics for Global Health (Malawi site)</i>	£170,000	2020 –
National Institute for Health Research <i>Health Protection Research Unit Gastrointestinal Diseases</i>	£3,700,000	2020 –
Engineering and Physical Sciences Research Council <i>Impact of network structured populations on evolution</i>	£454,655	2021 –
Biotechnology and Biological Sciences Research Council <i>High quality long read sequencing from low input DNA</i> Purchase of PacBio Sequel II	£418,686	2020 –

### Key scientific publications

Google scholar: 67 publications, 1789 citations, h-index 23, [complete record](#)

Bengtsson, R.J., Dallman, T., ...et al ...Pulford, C.V., Bennett, R.J., **Baker, K.S.**, (2021)  
Accessory genome dynamics and structural variation of *Shigella* from persistent infections.  
*mBio. In press.* doi: 10.1101/2020.09.28.316513

Hawkey, J., Paranagama, K., **Baker, K.S.**, Bengtsson, R.J., Weill, F.X., Thomson, N.R., Baker, S., Cerdeira, L., Iqbal, Z., Hunt, M., Ingle, D.J., Dallman, T.J., Jenkins, C., Williamson, D.A., Holt, K.E. (2021) Global population structure and genotyping framework for genomics surveillance of the major dysentery pathogen, *Shigella sonnei*. *Nature Communications*. In press. Preprint doi: 10.1101/2020.10.29.360040

Stenhouse, G.E., Jere, K., ... *et al* ... Cunliffe, N.A., Cornick, J. **Baker, K.S.** (2021) Whole Genome Sequence Analysis of *Shigella* from Malawi identifies fluoroquinolone resistance. *Microbial genomics*. In press.

Pulford, C.V., Perez-Sepulveda, B.M, ... Gordon, M.A., Feasey, N.A., **Baker, K.S.**, Hinton, J.C.D. (2020) The stepwise evolution of *Salmonella* Typhimurium responsible for bloodstream infection in Africa. (2020) *Nature Microbiology*

Mayers, C., **Baker, K.S.** (2020) Impact of false-positives and false-negatives in the UK's COVID-19 testing programme. [Policy advisory note](#) considered by SAGE.

**Baker, K.S.** (2020) Microbe hunting in the modern era: reflecting on decade of microbial genomic epidemiology. *Current Biology*. 30(19) R1124 – R1130.

Bennett, R. J., & **Baker, K.S.** (2019). Looking backward to move forward: The utility of sequencing historical bacterial genomes. *Journal of Clinical Microbiology*. 57(8). doi:10.1128/JCM.00100-19.

**Baker, K.S.**,<sup>^</sup> Dallman, T.J., Field, N., Childs, T., ...*et al* ... Jenkins, C., Thomson, N.R. (2018) Horizontal antimicrobial resistance transfer drives epidemics of multiple *Shigella* species. *Nature Communications*. (9/1:1462) <sup>^</sup> corresponding author

**Baker, K.S.**<sup>^</sup>, Campos, J., Pichel M.,...*et al* ... Perez, E., Thomson, N.R.<sup>^</sup> <sup>^</sup>joint corresponding authors (2017) Whole genome sequencing of *Shigella sonnei* through PulseNet Latin America and Caribbean: advancing global surveillance of foodborne illnesses. *Clinical Microbiology and Infection*. Nov; 23(11): 845 – 853

**Baker, K.S.**, Dallman, T., ... *et al* ... Weill, F.X., Jenkins, C., Thomson, N.R. (2015) Intercontinental dissemination of azithromycin-resistant shigellosis through sexual transmission: a cross sectional study. *The Lancet Infectious Diseases*. Aug (8) : 913 – 21.

Connor, T.\* , Barker, C.R.\* , **Baker, K.S.\***, Weill, F.X., ... *et al* ... Keddy, K.H., Thomson, N.R. (2015) Species-wide whole genome sequencing reveals historical global spread and recent local persistence in *Shigella flexneri*. *eLife*. 4 e07335

**Baker, K.S.**, Mather, A.E., ... *et al* ... Russell, J., Thomson, N.R. (2014) The extant World War 1 dysentery bacillus NCTC1: a genomic analysis. *The Lancet*. 384 (9955), 1691 – 1697

**Baker, K.S.**, Suu-Ire, R., ...*et al* ... Cunningham, A.A., Wood J.L.N., (2014) Viral antibody dynamics in a chiropteran host, *Journal of Animal Ecology*, Volume 83, Issue 2, 415–428.

**Baker, K.S.**, Leggett, R.M., ...*et al* ... Caccamo, M., Murcia, P.R. (2013) Metagenomic study of the viruses of African straw-colored fruit bats: detection of a chiropteran poxvirus and isolation of a novel adenovirus, *Virology*. Jul 5;441(2):95-106.

**Baker, K.S.**, Todd, S., ...*et al* ... Wood, J.L. & Wang, L.F. (2013) Novel potentially-zoonotic paramyxoviruses from the African straw-colored fruit bat, *Eidolon helvum*. *Journal of Virology*. 87(3):1348.

## Teaching

2014 – Present

I have a breadth of training, teaching and mentorship experience including supervision of research projects (1 completed PhD, 3 current primary supervisor), formal coursework, and short course teaching in the areas of microbiology, genomics, and bioinformatics of undergraduates and postgraduates at the University of Liverpool, and the broader academic community through roles on the Wellcome Trust Advanced Courses (in person and online).

## Internal leadership roles

2016 – Present

I hold/have held a variety of leadership positions, including: microbial genomics theme leader at the Centre for Vaccine Development, IVES institutional fellowship committee member, Centre for Genomics Research affiliate, public engagement and communications committee member, research theme lead on major research initiatives (the GI-HPRU). I also personally orchestrated local delivery of an external EMBO laboratory management leadership course. I further contribute to internal events through presenting, chairing, and organising collaboration days, grant funding, and training events, and meetings with external visitors.

## External leadership roles

In addition to my internal leadership roles and contributions, I hold significant esteem in the microbiology and genomics communities, as evidenced by the following:

- *Editorial board member, Microbial Genomics* 2019 –
- *Publication reviewer* for numerous leading journals 2010 –
- *Grant reviewer* for Wellcome and Leverhulme Trusts, French 2015 –  
and Scottish National Research Agencies, Cambridge colleges
- *Research proposal reviewer* Public Health England, Institute Pasteur
- *Funder panel member* NIHR Local Authority Advisory Task and 2020 –  
Finish group, cross-UKRI Data Innovation in Science funding panel
- *Postgraduate degree examiner* Universities of Cambridge, York, 2017 –  
Liverpool, and Edinburgh
- *Conference organiser* organising committee and session chair 2016 –  
'Genome Science', Microbiology Society session chair
- *Invited speaker* have delivered over 20 invited seminars, conference  
presentations, and plenary sessions for professional societies, academic  
research and higher education institutes.

## Impact and knowledge exchange

*Industrial collaboration: STOPENTERICS Consortium activity* 2013 – 2016

I was a member of an EU-consortium of industry and academic partners working toward developing vaccines for *Shigella* and Shiga-toxigenic *E. coli*. Responsible for genomics input and analysis.

*Policy advice: during the COVID-19 pandemic* 2020

I completed a 5-month secondment to the civil service team orchestrating the Scientific Advisory Group for Emergencies, led by Sir Patrick Vallance. In an independent capacity, I was part of an expert advisory panel that consulted with Deloitte and the Office for Life Sciences on various aspects of testing infrastructure during development.

*Public health impact: shaping practice and policy* 2013 –

For the last 8 years I have worked closely with public health agencies during their transition to microbial genomics for routine public health surveillance. A large successful program of capacity building [work completed](#) with the regional Latin America surveillance network was recently cited as a case study for antimicrobial resistance surveillance by the [WHO](#). More locally, work I did with PHE on sexually transmissible shigellosis, fed in to the management of an ongoing shigellosis outbreak and ultimately contributed to the [updating of treatment recommendations](#).

*Media engagement: across various projects*

2009 –

I am confident dealing with the media about my ongoing work including local and national television, live and pre-recorded radio, newspapers, and popular science magazines including: reporting on COVID-19 in [the Scientist](#), multiple features in the New Scientist, and extensive coverage of a commemorative [WW1 dysentery story](#). My work has also been featured in the popular science book 'The Tangled Tree' by David Quammen and the [New York Times](#)

*International network: community standing*

2009 –

I collaborate across a broad, international scientific and public health network including both human and animal public health agencies, I have over 200 co-authors from across 6 continents and engage the scientific community and the public through [interviews](#), [podcasts](#), and [blogs](#).

