Siân V. Owen

Curriculum vitae

Current affiliation & contact:
Department of Biomedical Informatics
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STATEMENT OF RESEARCH INTEREST & EXPERTISE

My research focusses on the fundamental molecular biology of temperate bacterial viruses (phages) and how they contribute to the biology, ecology and evolution of bacterial pathogens. I have expertise in genetic techniques including large-scale manipulations of bacterial chromosomes, phage engineering, as well as considerable experience in genomics and bioinformatics. Most recently I have become interested in high-throughput experimental technologies including robotic automation techniques, and experimental evolution. I seek to these apply cutting edge technologies to the field from which modern molecular biology was born, but has since been neglected: temperate phage biology.

EDUCATION & RESEARCH EXPERIENCE

2018 – pres. (Apr –)
Postdoctoral Research Fellow
Harvard Medical School
In the group of Professor Michael Baym
Working on a self-proposed research project to dissect the interaction between temperate prophages and evolution of antibiotic resistance in bacterial pathogens.

2017 – 2018 (Oct – Apr)
Postdoctoral Research Associate
University of Liverpool
In the group of Professor Jay Hinton
Working on a Wellcome Trust-funded project to identify the virulence determinants that allow African *Salmonella* Typhimurium to cause significant mortality in Africa

2013 – 2017
PhD in Biological Sciences
University of Liverpool
Supervised by Professor Jay Hinton and Dr Nicholas Feasey
Thesis title: Exploring the prophage biology of *Salmonella enterica* serovar Typhimurium ST313
Additional training modules included:
Programming for Life Sciences (Perl), Informatics for Life Sciences, Advanced Statistics for Biological Research

2012 – 2013
MRes in Biosciences (Awarded with distinction)
Cardiff University
Supervised by Dr Tom Connor
Thesis title: Population Structure and Differentiation of S*almonella* Paratyphi B and *Salmonella* Java
Modules studied include:
9 month research project, Key skills in research practice, Research techniques in Biosciences, Data handling and statistics, Bioinformatics

2009 – 2012
BSc in Microbiology (2:1)
Cardiff University
Final year project supervised by Dr Julian Marchesi
Dissertation title: Cloning and Expression of Bile Salt Hydrolase in *Escherichia coli*
Key modules: Medical microbiology, Microbiology research techniques, Non-bacterial pathogens, Human infectious diseases

2006 – 2008
International Baccalaureate Diploma (34 points)
Higher level subjects: Biology, Chemistry, English Literature
Standard level subjects: Spanish, Psychology, Mathematics
Self-directed research project entitled: The inhibitory effects of commercially available dental mouthwashes on bacteria

2001 – 2006 **GCSEs (12 awarded with grades A*-B)** Including Double A* award in Science

RESEARCH PUBLICATIONS

* Publications where I am first or joint-first author are indicated with an asterisk

Srikumar, S., Kröger, C., Hébrard, M., Colgan, A., **Owen, S.V.**, Sivasankaran, S.K., Cameron, A.D., Hokamp, K., Hinton, J.C.D., 2015. *RNA-seq Brings New Insights to the Intra-Macrophage Transcriptome of Salmonella Typhimurium.* PLOS Pathog. 11, e1005262.

Connor, T.R., **Owen, S.V.**, Langridge, G., Connell, S., Nair, S., Reuter, S., Dallman, T.J., Corander, J., Tabing, K.C., Le Hello, S., Fookes, M., Doublet, B., Zhou, Z., Feltwell, T., Ellington, M.J., Herrera, S., Gilmour, M., Cloeckaert, A., Achtman, M., Parkhill, J., Wain, J., De Pinna, E., Weill, F.-X., Peters, T., Thomson, N., 2016. *What's in a Name? Species-Wide Whole-Genome Sequencing Resolves Invasive and Noninvasive Lineages of Salmonella enterica Serotype Paratyphi B.* mBio 7. doi:10.1128/mBio.00527-16

*** Owen, S.V.***, Wenner, N., Canals, R., Makumi, A., Hammarlöf, D.L., Gordon, M.A., Aertsen, A., Feasey, N.A., Hinton, J.C.D., 2017. *Characterization of the Prophage Repertoire of African Salmonella Typhimurium ST313 Reveals High Levels of Spontaneous Induction of Novel Phage BTP1.* Front. Microbiol. 8, 235. doi:10.3389/fmicb.2017.00235

Faulkner, M., Rodriguez-Ramos, J., F. Dykes, G., **Owen, S.V.**, Casella, S., M. Simpson, D., J. Beynon, R., Liu, L.-N., 2017. *Direct characterization of the native structure and mechanics of cyanobacterial carboxysomes.* Nanoscale 9, 10662–10673. doi:10.1039/C7NR02524F

*** Ashton, P.M.*, Owen, S.V.***, Kaindama, L., Rowe, W.P.M., Lane, C.R., Larkin, L., Nair, S., Jenkins, C., de Pinna, E.M., Feasey, N.A., Hinton, J.C.D., Dallman, T.J., 2017. *Public health surveillance in the UK revolutionises our understanding of the invasive Salmonella Typhimurium epidemic in Africa.* Genome Medicine 9, 92. doi:10.1186/s13073-017-0480-7

*** Hammarlöf, D.L.*, Kröger, C.*, Owen, S.V.***, Canals, R., Lacharme-Lora, L., Wenner, N., Wells, T.J., Henderson, I.J., Wigley, P., Hokamp, K., Feasey, N.A., Gordon, M.A., Hinton, J.C.D., 2017. *Role of a single non-coding nucleotide in the evolution of an epidemic African clade of Salmonella.* PNAS 115(11) E2614-E2623. doi:10.1073/pnas.1714718115

*** Owen, S.V.***, Perez-Sepulveda, B.*, Adriaenssens, E., 2018. *Detection of bacteriophage: Sequence-based systems.* In Harper, D.R., Abedon, S.T., Burrowes, B.H., McConville, M.L. (Eds.) *Bacteriophages. Biology, Technology, Therapy.* Springer International Publishing [In Press]

Canals, R., Hammarlöf, D.L., Kröger, C., **Owen, S.V.**, Fong, W., Lacharme-Lora, L., Zhu, X., Wenner, N., Carden, S.E., Honeycutt, J., Monack, D.M., Kingsley, R.A., Brownridge, P., Chaudhuri, R.R., Rowe, W.P.M., Predeus, A.V., Hokamp, K., Gordon, M.A., Hinton, J.C.D., 2019. *Adding Function to the Genome of African Salmonella ST313.* PLOS Biol. [In Press]

CONFERENCE PRESENTATIONS

Sep 2014: EMBO Viruses of Microbes 2014, Zurich, Switzerland
Poster presentation: **RNA-seq from 16 infection-relevant conditions resolves the gene expression profiles and possible contribution to virulence of temperate bacteriophages within the genome of an invasive African *Salmonella* Typhimurium strain**

Aug 2015: 21ST Biennial Evergreen Bacteriophage Meeting, Evergreen State College, Washington State, USA
Poster presentation: **BTP1: A highly active prophage carried by African *Salmonella* Typhimurium ST313**

Apr 2016: Microbiology Society Annual Conference 2016, Liverpool, UK
Poster presentation: **The distribution of prophages in UK and African populations of *Salmonella* Typhimurium ST313**

Jul 2016: EMBO Viruses of Microbes 2016, Liverpool UK
15 minute offered oral presentation and poster: **Prolific spontaneous induction of novel prophage BTP1 in epidemic African *Salmonella* Typhimurium**

Sep 2016: 5th ASM Conference on *Salmonella*, Potsdam, Germany
Poster presentation: **Novel prophage BTP1 is associated with epidemic African *Salmonella* Typhimurium ST313 but not present in diverse UK lineages**

Apr 2017: Microbiology Society annual conference 2017, Edinburgh, UK
15 minute offered oral presentation: **Contrasting evolutionary fortunes for prophages in an epidemic Salmonella lineage**

Apr 2017: Centennial Celebration of Bacteriophage Research, Institute Pasteur, Paris, France
Poster presentation: **Contrasting evolutionary fortunes for prophages in an epidemic *Salmonella* lineage**

November 2017: Global Health Day conference- the UK contribution to innovation in global health, London, UK
Poster presentation: **Innovative public health surveillance in the UK revolutionises our understanding of the invasive *Salmonella* Typhimurium epidemic in Africa**

March 2018: 11th Annual Northwest Microbiology Meeting, Salford, UK
15 minute offered oral presentation: **Identification of a novel phage infection immunity protein by transcriptomic analysis of a *Salmonella* prophage**

March 2018: 5th Meeting of Regulating with RNA in Bacteria & Archaea, Seville, Spain
Poster presentation: **A prophage-encoded antisense RNA mediates phage superinfection exclusion in *Salmonella* Typhimurium**

AWARDS, PRIZES & INVITATIONS

Mar 2014 **Society for General Microbiology 'Society Conference Grant 2014'**- £120 towards attendance costs for the SGM Annual Conference, Liverpool, UK, 14-17 April 2014

Apr 2014 **Michael Pugh Thomas Fund for Postgraduate Students**- £300 towards attendance costs for the EMBO Viruses of Microbes Conference, Zurich, Switzerland, 14-18 July 2014

Mar 2015 **Highly commended poster** at the University of Liverpool Faculty of Health and Life Sciences Poster day

Apr 2015 **Best microbe-related talk & poster** at the Institute of Integrative Biology away day 2015- £100 personal prize

Jun 2015 **Society for General Microbiology 'Travel Grant 2015'-** £500 towards attendance at the 21st Biennial Evergreen International Phage Meeting Olympia, WA, USA, 02-07 August 2015

Dec 2015 **Third prize in the University of Liverpool Christmas card design competition**- £25 personal prize

Jul 2016 **Best poster presentation** at the University of Liverpool Genomes to Systems away day, as voted for by the Liverpool Life Sciences University Technical College students- £100 personal prize

Feb 2017 **Microbiology Society 'Society Conference Grant 2017'**- £240 towards attendance costs for the Microbiology Society Annual Conference, Edinburgh, UK, 3-6 April 2017

Dec 2017 **Moyne Institute invited Christmas lecture** Invited to give the annual Christmas lecture organised by the postgraduate microbiology society in the Moyne Institute, Trinity College Dublin, Ireland.

Dec 2017 **Microbiology Society 'Society Travel Grant 2018'**- £516 towards attendance costs for the 5th Meeting of Regulation with RNA in Bacteria & Archaea, Seville, Spain, 19-22 March 2018

Jan 2018 **Wellcome Trust Public Engagement Grant 2017 (co-applicant)-** £210 to run 'Let's Get Viral' family event about viruses at the Liverpool World Museum

July 2018 **Winner of Scientific Image Competition**- £100 personal prize for image of a flagellated *Salmonella* Typhimurium cell based on TEM.

PROFESSIONAL MEMBERSHIPS

The Microbiology Society (previously Society of General Microbiology), UK
Society for Applied Microbiology (SFAM), UK
American Society for Microbiology (ASM), USA

TEACHING AND ENGAGEMENT ACTIVITIES

Advanced Microbiological Techniques Life 228 (2014, 2015, 2016, 2017) Postgraduate demonstrator on 7 week-long second-year module at the University of Liverpool. Responsibilities included supervising groups of students designing and undertaking short Microbiology research projects, supervising students carrying out set laboratory practical activities and delivering a 1-hour lecture on sterilization techniques.

Liverpool primary school student Microbiology outreach day (November 2015) Helped run at outreach activity day for local primary school children at the University of Liverpool to teach basic concepts about microbiology and infectious disease.

Virology Life 209 (2017) Tutor on second-year module at the University of Liverpool. Responsibilities included running a tutorial for groups of 6 students to discuss general aspects of bacteriophage biology and mark essays.

'Let's Get Viral' (January 2018) Co-organized and ran a Wellcome Trust-funded public engagement activity day at Liverpool World Museum (UK) to educate the public about what viruses are what are the positive and negative effects they have on our lives.

ACADEMIC REFERENCES

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Liverpool School of Tropical Medicine
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