

William Stevenson

Royal Society University Research Fellow
Molecular & Cellular Microbiology

This is an old CV but it has a good structure and is outcome focused.

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Education and Research Experience

2008-

Royal Society University Research Fellow and Senior Research Associate

University of Cambridge, Department of Pathology
Cellular Microbiology of *Chlamydia*

- awarded prestigious fellowship to establish independent laboratory studying the structure-function of Chlamydial effectors that promote intracellular survival
- BBSRC-funded PhD studentship awarded from Department-wide competition (Oct 2010-)
- supervising undergraduate research project; biochemical analysis of multiple *Chlamydia* GroELs
- established collaboration to examine role of *Chlamydia* in male infertility; obtained funding from the Infertility Research Trust
- maintained interests in projects studying host kinase recruitment and activation by EPEC (until 2010), actin polymerisation by related EHEC, and novel roles of *Salmonella* entry effectors in subsequent intracellular replication (until 2009)

2002-2008

Research Associate

University of Cambridge, Department of Pathology

Structure-function of type III effector proteins from *Salmonella* and pathogenic *E.coli*

- first report in the literature of positive cooperativity between two bacterial effectors delivered into cells
- identified effector-derived polypeptide that inhibits both *in vitro* effector activity and bacterial cell entry
- worked with other postdoctoral researchers and graduate students on multiple projects examining the role of cholesterol in *Salmonella* entry, the identification of a cholesterol-binding effector, screening for intracellular effector interplay, comparative analysis of *Shigella* effectors, and effector structure and membrane topology
- involved in collaborative project (Cambridge and US) characterising an outer membrane autotransporter from enteropathogenic *E.coli* (EPEC); electron microscopy and analysis of purified protein; established functional assays using intimin proteoliposomes and cultured cells
- worked with graduate student to identify a host kinase responsible for tyrosine phosphorylation of the translocated EPEC receptor
- contributed to preparation of studentship applications and Project and Programme grant proposals to the Wellcome Trust, Medical Research Council and Biotechnology and Biological Sciences Research Council; co-applicant on Medical Research Council Project grant (2007)
- began lecturing and giving small group tutorials

1998-2002

PhD, Molecular Microbiology

University of Cambridge, Downing College and Department of Pathology

'Action of *Salmonella* invasion proteins' (supervisor, Prof. I. Antoniou)

- employed complementary biochemical, cell biology, *in vitro* reconstitution and imaging approaches to examine structure-function of effectors delivered into host cells by type III secretion system
- identified a prokaryotic actin-binding effector able to independently promote actin

- polymerisation and cross-link actin filaments *in vitro* and in cells
- purified hydrophobic effector, required for bacterial protein delivery across the host plasma membrane; demonstrated *in vitro* membrane fusion activity

1994-1998 BSc (Hons) 1st Class Genetics

University of York with year at the University of Bayreuth (Germany)

- highest mark in molecular biology; 2nd/120 in academic year
- competitively selected for one of two final-year projects at the Yorkshire Cancer Research Campaign Cancer Research Unit, an independent Institute within the Department of Biology; purification of human papillomavirus E7 protein (supervisor, Prof J. Chapman)
- attended lectures and seminars in biology and biochemistry, with oral and written exams in German
- undertook full-time six month research project at the Institut Genetik (supervisor, Prof M. Fischer); worked and presented data in German; resulted in first research publication

Graduate and Undergraduate Teaching Experience

Teaching

- 2010- Supervisor of 4-year BBSRC-funded PhD student**
- awarded in competition for quota studentships across the Department of Pathology
 - nominated Divisional representative on Departmental **selection panel** that interviewed all applicants
 - assisted with day-to-day supervision of graduate students as a Research Associate
 - offering experimental advice
 - proof-reading thesis drafts
 - knowledge of University procedures for deferral, mediation, intermission, submission
- 2010- Graduate mentor** for Divisional PhD student
- providing pastoral guidance and support independently of the supervisor
- 2004-2005 Session leader** 'Hot Topic' sessions Wellcome Trust 4-year Infection & Immunity PhD programme
- leading discussions about 'cutting-edge' research with 4-5 first year graduate students
 - explain theory behind experimental approaches
 - demonstrate laboratory techniques and supervise at workpractice
 - assist student with data analysis and interpretation
- 2003- Undergraduate lecturing** for final year (Part II) B.A. Microbiology and Parasitology Option
- five lectures in cell biology and microbial pathogenesis (key cellular processes, cell entry, inter- and intracellular spread, intracellular survival) to ~45-60 undergraduates (natural science, medical and veterinary students)
 - extended to eight lectures to cover colleague's sabbatical leave (two academic years)
 - involved in curriculum development, planning and implementation with course organiser and other lecturers
 - in 2010 survey (48% class returned scores) an average of 71% students rated the lectures 'interesting (4/5)', while a further 8% rated them 'inspiring (5/5)'
- 2002- Advisor** for final year **undergraduate dissertations (11)**
- one-to-one meetings with undergraduate medical and veterinary students
 - advise on planning dissertation and relevant literature
 - provide constructive feedback on drafts
- 2001- biology Tutorials** for second (Part 1b) and final year undergraduates in microbiology and cell
- leading discussion and setting essays in group sizes from 2-6 students
 - marking essays and providing detailed and constructive feedback

- advising on exam technique and general pastoral care

2000-	Supervisor for final year undergraduate research projects (6) <ul style="list-style-type: none"> • two as independent supervisor, three as a postdoctoral researcher, one as a graduate student • introduce project background, then advise on relevant additional • provide constructive feedback on project report drafts
Examining	
2010-2011 Tripos	University Examiner for second year (Part Ib) Natural Science & Medical & Veterinary <ul style="list-style-type: none"> • setting questions for multiple choice, essay and practical examinations • overall responsibility for Microbiology • starting examinations • marking essay and practical scripts (~400-500) • interaction with external examiner and colleagues
2006-2010 Tripos	University Examiner for final year (Part II) Natural Science & Medical & Veterinary <ul style="list-style-type: none"> • jointly responsible for overall conduct of examinations • setting questions for essay and data handling examinations • starting examinations • marking scripts, projects and dissertations (~200) • moderating marks and interacting with external examiner and colleagues
2008-	Internal examiner for first year assessments of Departmental graduate students (3)
2003-2006	University Assessor for final year (Part II) Natural Science & Medical & Veterinary Tripos <ul style="list-style-type: none"> • second marking examination scripts • interaction with Examiners and other colleagues
2001	Invigilator for second year (Part Ib) Pathology Practical Examinations

Research Funding

W Stevenson (PI) and A Hassan (co-PI; Health Protection Agency, Cambridge)
Infertility Research Trust, UK 'Effects of Chlamydial urethritis on semen quality'
£92000 (36 months from 1/10/2010); rescinded due to economic conditions
re-approached Trust and negotiated a replacement seed-corn research grant £37000 (24 months)

Awarded to W Stevenson by Department of Pathology (quota studentship)
BBSRC-funded 4 year PhD studentship 'Structure-function analysis of Chlamydial inclusion proteins'
£44738 (48 months from 1/10/2010)

W Stevenson
Royal Society University Research Fellowship 'Cellular microbiology of *Chlamydia* infection'
£442000 (FEC) (60 months from 1/10/2008)

I Antoniou and **W Stevenson (co-PI)**
Medical Research Council Project Grant 'Assembly of actin pedestals central to adhesion of enteropathogenic *E.coli*'
£188654 (36 months from 1/11/2007)

Collaborations

- 2010-** **Dr Amal Hassan** (Consultant, Health Protection Agency, Addenbrooke's Hospital, Cambridge)
- ongoing collaboration initiated to examine the potential role of *Chlamydia* in male factor infertility; examination of clinical material; *in vitro* reconstitution of interactions
 - successful application for research funding
- 2009-** In setting up my laboratory and establishing new work on Chlamydia, I have fostered valued contacts in the UK; while not formally collaborating, Professor Michael Ellis (Southampton University), Professor N Bond (Cambridge University) and Dr B Corteen (Imperial College, London) have provided essential advice and generously donated important start-up materials
- 2005-2010** **Professor Bob Marsden** and **Dr Chris Sullivan** (University of Massachusetts Medical School, USA)
- involved in this productive collaboration as a Research Associate; autotransporter structure and actin polymerisation by EHEC
 - co-authored three publications
- 2002-2004** **Professor David Hill** and **Dr Annabel Clarke** (University of Newcastle-upon-Tyne, UK)
- collaborative work examining the presentation of *Salmonella* invasion proteins to the immune system during infection
 - co-authored publication

Peer-Review Experience

Referee for research papers and reviews submitted to:

Proceedings of the National Academy of Sciences USA, Nature Reviews Microbiology, PLoS Pathogens, Journal of Cell Science, Molecular Microbiology, Environmental Microbiology, Journal of Bacteriology, Microbial Pathogenesis

Additionally, I have co-reviewed research papers and reviews submitted to:

Nature, Cell, Cell Host & Microbe, Nature Medicine, EMBO Journal, Current Biology, Journal of Cell Biology, Journal of Biological Chemistry, EMBO Reports, Cellular Microbiology, Trends in Microbiology, Infection and Immunity, Molecular and Cellular Biology, Molecular Biology of the Cell

and research grants submitted to:

The Wellcome Trust, Medical Research Council, Biological and Biotechnology Research Council, National Institute of Health (USA), Der Wissenschaftsfonds (Austria)

Senior Reviewer for **The Triple Helix** (International Journal of Science, Society and Law)

Invited Presentations and Conference Attendance

- 2010** 'Uncloaking the cellular microbiology of Chlamydial infection'
Department of Genetics, University of Cambridge
- 2009** 'Exploiting enteropathogenic *E.coli* to model transmembrane receptor signalling'
13th European Workshop on Bacterial Protein Toxins, San Martino al Cimino, Italy
- 2009** 'Subversion of the host actin cytoskeleton by bacterial enteropathogens'
Helmholz Zentrum für Infektionsforschung, Braunschweig, Germany
- 2007** 'Adhesion pedestal assembly by enteropathogenic *E.coli*'
Department of Pathology Symposium, St. John's College, Cambridge
- 2002** 'Action of *Salmonella* invasion proteins'
Frontiers of Cellular Microbiology and Cell Biology, Euroconference on Signalling and Cytoskeleton Plasticity (EURESCO) Giens, France

- 2002** 'Salmonella SipB, a prokaryotic membrane fusion protein?'
4th International Workshop on Pore-Forming Toxins, Trento, Italy
(**Medical Microbiology and Immunology** 189:38)
- 2002** 'Action of *Salmonella* invasion proteins'
Department of Microbiology and Immunology, University of Newcastle-upon-Tyne, UK

In addition to the invited presentations outlined above, I have also given regular presentations in Divisional and Departmental settings. I have been selected to **present posters at National** (Society General Microbiology, British Society Cell Biology) and **European Meetings** [including, Frontiers of Cellular Microbiology (2002, France; 2006, Spain), 4th International Workshop on Pore-Forming Toxins (2002, Italy)].

In **2000**, I was one of ~50 international graduate students and early postdoctoral researchers selected to attend the **EMBO/FEBS/UNESCO International Summer School of Molecular and Cellular Biology on Microbial Pathogenesis** (Spetses, Greece), a 2-week retreat with reputed investigators in the field, comprising lectures and small-group tutorials.

Public Engagement

- 2010, 2009** **National Science Week** - University of Cambridge, Department of Pathology
- jointly prepared and manned Microbiology exhibit; public engagement
 - securing Departmental funding and external sponsorship; procuring necessary equipment; preparing prior risk assessments; coordinating additional volunteers to staff exhibits; planning and preparing posters and audiovisual material; ensuring coverage and interview for Naked Scientists radio broadcast
- 2009** **Alumni Day** - University of Cambridge, Department of Pathology
- one of four researchers selected to be interviewed (~20 min) in front of 250 Cambridge alumni visiting the Department; questions on microbiology and bacterial infection taken from the floor with no prior preparation
- 1998** **'Beyond 2000'** - a two-day conference to promote science at Harrogate Ladies College
- one of four biology undergraduates who volunteered to prepare a workshop to explain and demonstrate 'DNA fingerprinting' to A-level and GCSE students
 - oral presentation, practical demonstration; radio interview
- 1996, 1998** **Open Day** - University of York, Department of Biology
- guiding groups of students and visitors on tours of the Department

Organisational and Administrative Experience

- 2004-** **Divisional IT Support Contact** for Microbiology and Parasitology
- 2006-2008** Assisted with maintenance and user training in the **Class 2 pathogen suite**
- 2004-2007** **Information Technology Committee**, Department of Pathology
- 2002-2008** Maintained **web pages** for Microbiology laboratories
Assisted with **COSHH Health and Safety** assessments for Microbiology laboratories
- 2001-2008** Oversaw **radioactivity** training, risk assessments, storage and disposal for Microbiology laboratories
- 1996-1997** **Undergraduate Representative**, University of York, Department of Biology Board of Graduate Studies

Personal Development

2011 Workshop for **new graduate student supervisors** (Personnel Dept, Cambridge University)

2010-2011 **Principal Investigators Development Programme** (Personnel Dept, Cambridge University)

- 'Leading your research team'
- 'Overview of research project management'
- 'Research grant workshops'
- 'Essential HR'

Original Research Publications

- 2011** **Stevenson W***, Hume PJ*, Humphreys D*, Phillips N*, Smith K*, Antoniou I. Clustering transfers the translocated E.coli receptor into lipid rafts to stimulate reversible activation of c-Fyn. (*authors contributed equally)
Cellular Microbiology 11:433-441
- 2010** Sullivan C, Cheng H-C, Robbins D, Siripala AD, McGhie EJ, **Stevenson W**, Welch MD, Rosen MK, Antoniou I, Marsden B. Repetitive N-WASP-binding elements of the enterohemorrhagic E.coli effector EspFU synergistically activate actin assembly.
PLoS Pathogens 4(10):e1000191
- 2010** Cain RJ*, **Stevenson W***, Antoniou I. Deciphering interplay between Salmonella invasion effectors.
PLoS Pathogens 4:e1000037 (*authors contributed equally)
[Featured article in April 2010 Issue]
- 2009** Brawn LC, **Stevenson W**, Antoniou I. Salmonella SPI1 effector SipA persists after entry and co-operates with a SPI2 effector to regulate phagosome maturation and intracellular replication.
Cell Host & Microbe 1:63-75
- 2007** **Stevenson W**, Cain RJ, McGhie EJ, Phillips N, Garner MJ, Antoniou I. Cholesterol binding by the bacterial type III translocon is essential for virulence effector delivery into mammalian cells.
Molecular Microbiology 56:590-603
[Microcommentary: ***Molecular Microbiology*** 56:575-577]
- 2006** Cain RJ, **Stevenson W**, Antoniou I. The target cell plasma membrane is a critical interface for Salmonella entry effector-host interplay.
Molecular Microbiology 54:887-904
- 2006** Phillips N, **Stevenson W**, Antoniou I. Phosphorylation of the enteropathogenic E.coli receptor by the Src-family kinase c-Fyn triggers actin pedestal formation.
Nature Cell Biology 6:618-625
[Related Commentaries: ***Molecular Cell*** 15:495-497; ***Science*** 306:65-67; ***Nature Signaling Gateway*** July 2006]
- 2006** McGhie EJ, **Stevenson W**, Antoniou I Control of actin turnover by a Salmonella invasion protein.
Molecular Cell 13:497-510
[News & Views: ***Molecular Cell*** 13:453-454; ***Developmental Cell*** 6:314-315]

- 2006** Touze T, **Stevenson W**, Eswaran J, Marsden B, Antoniou I. Self-association of EPEC intimin mediated by the B-barrel-containing anchor domain: a role in clustering of the Tir receptor. *Molecular Microbiology* 51:73-87
- 2005** Hume PJ*, McGhie EJ*, **Stevenson W***, Antoniou I. The purified Shigella IpaB and Salmonella SipB translocators share biochemical properties and membrane topology. *Molecular Microbiology* 49:425-441 (*authors contributed equally)
- 2004** **Stevenson W**, Hume PJ, McGhie EJ, Antoniou I. A Salmonella SipB-derived polypeptide blocks the 'trigger' mechanism of bacterial entry into eukaryotic cells. *Molecular Microbiology* 45:1715-1727
- 2004** Clarke A, **Stevenson W**, Devlig AA, Hormaeche CE, Antoniou I, Hill D. Processing of viable Salmonella typhimurium for presentation of a CD4 T cell epitope from the Salmonella invasion protein C (SipC). *European Journal of Immunology* 32:2664-2671
- 2004** McGhie EJ, Hume PJ, **Stevenson W**, Torres J, Antoniou I. Topology of the Salmonella invasion protein SipB in a model bilayer. *Molecular Microbiology* 44:1309-1321
- 2004** Garner MJ*, **Stevenson W***, Antoniou I. The Salmonella pathogenicity island 1 secretion system directs cellular cholesterol redistribution during mammalian cell entry and intracellular trafficking. *Cellular Microbiology* 4:153-165 (*authors contributed equally)
- 2003** McGhie EJ*, **Stevenson W***, Antoniou I. Co-operation between actin-binding proteins of invasive Salmonella: SipA potentiates SipC nucleation and bundling of actin. *EMBO Journal* 20:2131-2139 (*authors contributed equally)
- 2002** **Stevenson W**, McGhie EJ, Antoniou I. Membrane fusion activity of purified SipB, a Salmonella surface protein essential for mammalian cell invasion. *Molecular Microbiology* 37:727-739
- 2001** **Stevenson W**, Antoniou I. Direct nucleation and bundling of actin by the SipC protein of invasive Salmonella. *EMBO Journal* 18:4926-4934
- 1998** Mogk A, **Stevenson W**, Fischer M. Integrative vectors for constructing single-copy transcriptional fusions between Bacillus subtilis promoters and various reporter genes encoding heat-stable enzymes. *Gene* 182:33-36

Reviews and Commentaries

- 2008** **Stevenson W***, Marsden B, Antoniou I, Sullivan C*. Exploiting pathogenic E.coli to model transmembrane receptor signalling. *Nature Reviews Microbiology* 4:358-370 (*authors contributed equally)
- 2008** **Stevenson W**, Antoniou I. Preview: Pathogens reWritE Rho's rules. *Cell* 124:15-17
[Highlighted in *Science STKE (2008)* Under pathogen attack 319:32]
- 2008** **Stevenson W** British Society of Cell Biology Autumn Meeting Report. *British Society Cell Biology Newsletter*

- 2006 Stevenson W**, Phillips N, Antoniou I. Complex kinase requirements for EPEC pedestal formation: Response.
Nature Cell Biology 6:795-796
- 2004 Stevenson W §**, Antoniou I. Direct modulation of the host cell cytoskeleton by Salmonella actin binding proteins.
Trends in Cell Biology 12:15-20 (§corresponding author)
- 2003** McGhie EJ, **Stevenson W**, Antoniou I (**2001**) Collective efforts to modulate the host actin cytoskeleton by Salmonella type III secreted effector proteins : Response.
Trends in Microbiology 9:569-570

Academic Referees

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