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About

Peter has published over 200 research papers in the areas of molecular evolution and epidemiology of antibiotic resistance, *Clostridium difficile*, tuberculosis and molecular diagnostics for infectious diseases. He is a regular speaker at international conferences and advisory boards on these topic areas. Peter has edited two widely used clinical microbiology post graduate textbooks: Principles and Practice of Clinical Bacteriology (Wiley) and Medical Bacteriology (OUP). His research support comes from the Department of Health (DoH), HPA, NERC, Wellcome Trust and the pharmaceutical industry. For the last 15 years Peter has researched extensively on the subject of antibiotic resistance in S.E. Asia particularly through collaborative projects with colleagues in China and is visiting Professor at Xiangya Hospital, South Central University, Changsha. He is currently involved in shaping UK national policy on nosocomial infection control and antibiotic resistance by chairing and participating in expert groups and committees in the UK and Europe.

Peter Hawkey is a leading member of the SRMRC. Find out more about the work of the research centre on the **SRMRC website (http://www.srmrc.nihr.ac.uk)** .

Qualifications

- DSc, University of Leeds, 2002
- MRCPath 1984
- MD, University of Bristol, 1983
- MB BS, University of London (Kings College Hospital), 1978
- BSc (Hons) Microbiology, University of East Anglia, 1972

Biography

Peter Hawkey started his scientific career as a plant pathologist working on *Gleosporium perrenans* a fungal storage pathogen of pathogen in apples at East Malling Research Station. A longstanding attraction to medical microbiology following a research post in 1971 at Kings College Hospital prompted enrolment for a medical degree. Experience as a junior doctor looking after patients with the superbug of the 1970's, gentamicin resistant, *Klebsiella pneumoniae* kindled a life-long interest in the mechanism and evolution of plasmid mediated resistance to antibiotics in gram negative bacteria.

Recruitment as a lecturer at the University of Bristol to work on gentamicin resistant *Providencia stuartii* resulted in a higher degree studying transposition immunity and composite transposon formation *in vivo* mediated by *Tn3*. This thesis was supervised by Peter Bennett and Sir Mark Richmond, the MRCPath being obtained concurrently.

Due to lack of promotion opportunities in Bristol a move to work with Richard Lacey in Leeds as Senior Lecturer and subsequently a personal chair in 1992 facilitated the development of his research group which worked on molecular evolution of plasmids and antibiotic resistance genes in *Enterobacteriaceae, Neisseria gonorrhoeae* and acinetobacter. The early application in 1989 of PCR to *M. tuberculosis* led to a further research area resulting in the development of clinical diagnostics for TB using PCR and rapid PCR-based typing techniques for *M. tuberculosis*.

An invitation by WHO to run a workshop in Guangzhou, China in 1997 led to the characterisation and first description of the gene encoding second most common CTX-M Extended Spectrum Beta Lactamase (ESBL) in the world, CTX-M-14. His longstanding interest in the evolution and development of antibiotic resistance in China and the Far East has resulted in a number of important publications in the arena of molecular epidemiology of antibiotic resistance. A move to the chair of public health and clinical bacteriology, which was newly established jointly by the University of Birmingham, HPA and Heart of England Foundation Trust, enabled more extensive development of research on the molecular epidemiology of *M. tuberculosis*, the environmental flow and evolution of antibiotic resistance genes in collaboration with the University of Warwick and the antibiotic research group founded by Laura Piddock. Peter's group was the first to describe the existence of variable number tandem repeat DNA elements within the *Staphylococcus aureus* genome and to exploit those variable elements for rapid molecular typing to identify cases of cross-infection in patients. The application of the same technology to *Clostridium difficile* has led to research work on sub-typing of the dominant clones of *Clostridium difficile* in the UK and to chairing the Department of Health working party producing the definitive guidance on the control and management of *Clostridium difficile* infection for England. A similar role has been filled in relation to ESBL and carbapenemase producing *Enterobacteriaceae* for the DoH through the Advisory Committee on Antimicrobial Resistance and Healthcare Associated Infections (ARHAI) of which Peter was a founder member.

Teaching

Teaching Programmes

Medicine and Surgery MBChB (/undergraduate/courses/med/medicine.aspx)

Medical Science BMedSc (/undergraduate/courses/med/biomedical-science.aspx) (Intercalated)

Medical Science BMedSc (/undergraduate/courses/med/biomedical-science.aspx)

Dental Surgery BDS (/undergraduate/courses/med/dental-surgery.aspx)

Postgraduate supervision

Peter is interested in supervising doctoral research students in the following areas:

- Mechanisms and molecular epidemiology of antibiotic resistance in *Enterobacteriaceae* and MRSA.
- Molecular epidemiology and pathogenesis of *Clostridium difficile*.
- Molecular epidemiology and phylogeny of *Mycobacterium tuberculosis*.

If you are interesting in studying any of these subject areas please contact Peter on the contact details above, or for any general doctoral research enquiries, please email: **dr@contacts.bham.ac.uk (mailto:dr@contacts.bham.ac.uk)** or call +44 (0)121 414 5005.

For a full list of available Doctoral Research opportunities, please visit our **Doctoral Research programme listings (http://www.bham.findaphd.com/?es=y&apl=y&aplt=&show)**

Research

RESEARCH THEMES

Antimicrobial resistance, molecular epidemiology, rapid diagnostics for infection, clinical trials.

Peter's work focuses on the following 4 areas:

RESEARCH ACTIVITY

Novel resistance mechanisms

Peter's research group is currently studying widely dispersed and clinically very important mechanisms of resistance to Extended Spectrum cephalosporins and carbapenem antibiotics. Collaboration both locally across the Midlands and internationally in China and India are involved in characterising the molecular basis and genetic mobility of newly emerging and emerged resistance genes to these antibiotics.

Molecular epidemiology

Peter has been involved in developing novel molecular characterisation techniques for nosocomial (hospital acquired) bacteria for over 30 years. The group is exploring the use of genomics and other genetic techniques which can be applied quickly to differentiate particular clones of bacteria causing nosocomial infection. A wide range of pathogens from *Staphylococcus aureus*, *Enterobacteriaceae*, *Clostridium difficile* and *Mycobacterium tuberculosis* is studied by the group.

Identification of nosocomial pathogens

Rapid methods for screening patients and identifying nosocomial bacteria using and developing both novel and existing methodologies which are subjected to clinical trial by the group.

Novel interventions to reduce nosocomial infection

Currently studied approaches include the introduction of clinical care systems to enhance control of nosocomial infection and the use of novel probiotic strategies.

Other activities

- Member of ARHAI
- Chair of DoH Working Group on Control of *C. difficile* and Multi Resistant Gram Negative Bacteria
- Examiner for the Royal College of Pathologists
- Chairman of NEQAS Microbiology Steering Committee
- Regional microbiologist for HPA West Midlands
- Member DEFRA Antimicrobial Resistance Co-ordination Group

Publications

Evans JT, Serafino Wani RL, Anderson L, Gibson AL, Smith EG, Wood A, Olowokure B, Abubakar I, Mann JS, Gardiner S, Jones H, Sonnenberg P, Hawkey PM. (2011). A geographically-restricted but prevalent Mycobacterium tuberculosis strain identified in the West Midlands Region of the UK between 1995 and 2008. PLoS One. 6:e17930

Gaze WH, Zhang L, Abdouslam NA, Hawkey PM, Calvo-Bado L, Royle J, Brown H, Davis S, Kay P, Boxall AM, Wellington EM. (2011). Impacts of anthropogenic activity on the ecology of class 1 integrons and integron-associated genes in the environment. ISME J. [Epub ahead of print]

Xu L, Shabir S, Bodah T, McMurray C, Hardy K, Hawkey P, Nye K. (2010). Regional survey of CTX-M-type extended-spectrum β-lactamases among Enterobacteriaceae reveals marked heterogeneity in the distribution of the ST131 clone. Journal of Antimicrobrial Chemotherapy. 66:505-11.

Byrne-Bailey KG, Gaze WH, Zhang L, Kay P, Boxall A, Hawkey PM, Wellington EM. (2011). Integron prevalence and diversity in manured soil. Applied Environmental Microbiology. 77:684-7.

Orendi JM, Coetzee N, Ellington MJ, Boakes E, Cookson BD, Hardy KJ, Hawkey PM, Kearns AM. (2010). Community and nosocomial transmission of Panton-Valentine leucocidin-positive community-associated meticillin-resistant Staphylococcus aureus: implications for healthcare. Journal of Hospital Infection. 75:258-64.

Hardy KJ, Gossain S, Thomlinson D, Pillay DG, Hawkey PM. (2010). Reducing Clostridium difficile through early identification of clusters and the use of a standardised set of interventions. Journal of Hospital Infection. 75:277-81.

Evans JT, Gardiner S, Smith EG, Webber R, Hawkey PM. (2010). Global Origin of Mycobacterium tuberculosis in the Midlands, UK. Emerging Infectious Diseases. 16:542-5.

Tanner HE, Hardy KJ, Hawkey PM. (2010). Coexistence of multiple multilocus variable-number tandem-repeat analysis subtypes of Clostridium difficile PCR ribotype 027 strains within fecal specimens. Journal of Clinical Microbiology. 48:985-7.

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