

Appendix: University of Leicester – Research Opportunities

Cardiology

Research in Cardiology at the University of Leicester is based at the Department of Cardiovascular Sciences, which is the largest within the College of Life Sciences. The Department's mission is to undertake bench-to-bedside research, education and training, and clinical practice that impacts on the health and well-being of patients and the public.

The Department of Cardiovascular Sciences has laboratory and clinical research facilities at Glenfield Hospital, the regional cardiac centre, including the £12.5M state-of-the-art University of Leicester British Heart Foundation (BHF) Cardiovascular Research Centre, as well as research facilities at the Leicester Royal Infirmary, the Henry Wellcome Building and Hodgkin Building at the main University campus. The Department hosts two BHF-funded Chairs (Cardiology: held by Professor Sir Nilesh Samani until 31 Jul 2016; Cardiac Surgery: Professor Gavin Murphy), a National Institute of Health Research Chair (Professor Gerry McCann) and the Cardiovascular Theme of the NIHR Biomedical Research Centre. There are strong links with the University Hospitals of Leicester NHS Trust, where senior clinical academics provide leadership in patient care, as well as undergraduate and postgraduate medical teaching and training.

Cardiovascular Research has been a strength of the Leicester Medical School since its inception. The work of the Department has contributed to major advances in the treatment of coronary heart disease, cardiac arrhythmias, heart failure, hypertension and stroke, and at a fundamental level improved our understanding of the causes, including genetic predisposition, to cardiovascular diseases. Research is supported by strong Programme level funding from the BHF, NIHR and Medical Research Council. In the 2014 Research Excellence Framework, Cardiovascular Sciences contributed significantly to the University's Clinical Medicine (UoA1) submission; over 70% of research was classified as internationally excellent (22% world leading), and 2 of the 4 submitted impact studies were cardiovascular and rated 4*.

The overarching strategy for cardiovascular research is based on two main principles: (i) to integrate high quality basic and clinical science research, and (ii) to focus on common cardiovascular diseases and on questions of direct clinical relevance and impact. In keeping with the University's Strategic Plan for discovery-led research that 'delivers and supports excellent research in all its forms', our research is focussed across two major research themes, allied to those of the Cardiovascular Theme of the National Institute for Health Research Leicester Biomedical Research Centre:-



- 1) Cardiovascular Precision and Stratified Medicine (Biomarkers, Genomics, Imaging)
- 2) Drug / Device: Discovery / Intervention and Clinical Trials (Preclinical, translational and clinical trials)

The clinical Cardiology department is a busy cardiac centre providing secondary care to the local population as well as covering a tertiary population of ~3.5 million in the East Midlands for specialist services which forms a strong base for clinical delivery and research activities. Ground-breaking work include novel stents for percutaneous coronary interventions, the first UK series of transcatheter aortic valve implant, world-first robotic catheter ablation for cardiac arrhythmias and world-leading discovery of genomic basis for coronary artery disease. The department continues to lead in many aspects of cardiac research including advanced cardiac imaging (CMR, PET, CT), novel mapping and ablation for complex arrhythmias (AF and VT), biomarker discovery and proteomics, heart failure, spontaneous coronary artery dissection and cardiovascular genomics. There is strong preclinical research into mechanisms underlying sudden cardiac death, aortic pathologies and drug discovery into vascular signalling pathways. In addition, there is active interaction with Engineering and Informatics colleagues both internally within the University and externally through other academic and commercial collaborations especially in the areas of medical device research, enterprise and technology transfer. This includes active programmes in data science, biomedical signal processing and the application of artificial intelligence and deep learning to cardiological data. There is also excellent research infrastructure to support clinical studies and trials from the NIHR BRC as well as the Clinical Trials Unit.

The ACL will be supported in the research group(s) with relevant clinical / research interests. All aspects of foundation and specialist clinical cardiology training are available to the ACL, supported by a well-structured training programme allowing for research training in parallel aimed at developing the individual into an independent researcher with strong academic output.

Medical Microbiology – The Leicester Microbiology and Infectious Diseases (LeMID) Centre

Medically oriented microbiology research at Leicester is coordinated by [LeMID](#), a coalition of 20 principal investigators who were recently formally awarded Centre status within the University. We hold current funding from NIHR, the Wellcome trust, MRC and BBSRC as well as significant industry support. Academics are mainly based in the Department of Genetics and Genome Biology (GGB) and the Department of Respiratory Sciences (RS) and there is also major commitment from the Infectious and Tropical Diseases Unit and the Department of Clinical Microbiology at UHL. Successful applicants will be expected to develop an area of research in close association with one of the established programmes.



Key areas for this post are the development of bacteriophages for therapeutics and other areas of clinical practice (Prof Martha Clokie and Dr Andy Millard); pneumonia, particularly *Streptococcus pneumoniae* (Profs Marco Oggioni and Peter Andrew and Dr Hassan Yesilkaya); pathogen population biology (*N. meningitidis*, *H. influenzae*, *C. jejuni* – Dr Chris Bayliss); the effects of particulate airborne pollution on respiratory pathogens (Dr Julie Morrissey and Prof Peter Andrew); and tuberculosis (Profs Mike Barer, Andrea Cooper and Galina Mukamolova, - Drs Manish Pareek, Pranab Haldar and Helen O’Hare) and microbiome studies (Barer and Morrissey).

Applicants with evidence of commitment to infection research should discuss their application with the lead investigators concerned and with the relevant Head of Department Prof Alison Goodall (GGB) Tel: 0116 2523019, Prof Mike Barer (RS) Tel:0116 252 2951) who can also assist with contacting the relevant lead investigator.

Gastroenterology – Medical Education – Patient Safety

The Department of Health Sciences is a multidisciplinary unit with over £12m in current live grant funding, and around 140 staff. It incorporates research groups with a breadth of disciplinary, methodological and clinical strengths, and a programme of research and teaching of internationally recognised quality, located within a new £42 million state-of-the-art centre (the largest investment in medical teaching and applied health research by any UK university in the last decade). Three quarters of the University’s submission to Unit of Assessment 2 of the most recent Research Excellence Framework—which consisted predominantly of Health Sciences staff—was rated as ‘world leading’ or ‘internationally excellent’.

A notable strength of the Department is its research on healthcare quality and safety, led by the SAPPHIRE (Social Science Applied to Healthcare Improvement Research) group. SAPPHIRE’s internationally recognised work uses qualitative methods and theoretical insights from a range of social sciences to develop novel and actionable insights to help support the practice of healthcare improvement. SAPPHIRE provides a stimulating and supportive intellectual environment, the highest quality of supervisory relationship with a clear track record of successes for clinical academics at both doctoral and postdoctoral levels (including a current CL), national and international practitioner and academic networks that will help to secure maximum impact for the study, alongside a holistic academic and personal development for the CL. SAPPHIRE has a wide portfolio of both researcher-led and directly commissioned research and evaluation projects funded by a range of organisations (Health Foundation, including Health Foundation Improvement Science PhDs, only awarded to 10 institutions nationwide), the ESRC, various streams of the NIHR (including Programme Grants), the Department of Health and NHS England). The Head of Department and a member of SAPPHIRE (Professor Armstrong) holds a prestigious Health Foundation Improvement Science fellowship. SAPPHIRE is one of only 10 academic partners of The Healthcare Improvement Studies (THIS) Institute, a newly launched, £42m venture seeking to create a world-leading asset for the NHS by improving the science behind high quality healthcare organisation and delivery.



Collaborations between SAPHIRE and the University Hospital of Leicester's Department of Clinical Education around patient safety research, has given rise to grant income, joint publications, and impact on practice (e.g. the development and implementation of a tool for recording and acting on low-level concerns expressed by junior doctors). The Department of Health Sciences, the College of Life Sciences and other healthcare organisations have an extensive history of collaboration in applied health research including successive NIHR CLAHRC, programme grants, fellowships and project grants.

The study of improvement in healthcare quality and safety is an emerging academic field lying at the nexus of established sciences such as engineering, psychology, health and social sciences. It draws on theories and approaches from systems thinking, pedagogy, organisational learning and implementation science amongst others (all of which are expertise available within SAPHIRE, the Department of Clinical Education or their close collaborators) to improve quality in healthcare. SAPHIRE has been at the cutting edge of the development of the field. SAPHIRE's innovative application of social science theory and methods to practical problems of healthcare quality have led to new and well-received insights resulting in academic outputs in world leading journals.

Over 1.4 million adverse events (AEs) are reported yearly in the UK, with more than 10,000 classed as serious incidents (SI) and investigated by individual organisations(1). The occurrence of SIs call existing practices into question and are opportunities for healthcare staff and organisations to develop their knowledge and capabilities to improve patient safety. This learning process may happen through structured, formalised channels (e.g. newsletters, mortality and morbidity meetings and mandatory teaching), but equally important learning may also happen through more informal means, such as casual conversations between colleagues, discussions on social media, and subtle changes in norms and expectations.

It is proposed that the CL would undertake work which builds on current research conducted in the Department of Health Sciences focusing on the practice of SI investigations, which has developed important insights about the process, its potential limitations and the degree of congruence between recommended actions and identified causes. This translational project represents the logical next step in this research programme, moving the focus towards the learning that happens following SI investigations, drawing on insights from education, communication and organisation studies.

The research project aims to identify factors facilitating and limiting individual, group and organisational learning through formal channels, the manifestations of informal learning practices and the needs, drivers and opportunities for learning following SI investigations. The research will contribute to practice and to literature by formulating a set of recommendations to maximise learning following SI investigations. Taking an approach that accounts for the complex contexts within which such learning happens, this project will enable policy makers, managers and healthcare workers to challenge their beliefs about how to maximise learning following SI investigations. The research will use qualitative methods such as ethnography and interviews. Flexibility will be given to CLs to use particular SI investigations as case studies, depending on their clinical and academic interests. This research will act as a template for further study of learning in healthcare settings following related types of safety event.



In discussion with the SAPPHIRE group it may be possible for the CL to undertake research into other areas which fall within the current research interests of the group.

