

Institution: Kingston University
Unit of Assessment: 3, Allied Health Professions, Dentistry, Nursing and Pharmacy
<p>a. Overview</p> <p>The Unit comprises research in biomedicine, nutrition, pharmaceuticals, applied health care, and health care workforce development. Its research addresses important and complex health and wellbeing questions concerned with aging populations, long-term (chronic) conditions and public health, from the laboratory to the bedside. The research is focused in two centres:</p> <ol style="list-style-type: none"> 1. The Interdisciplinary Hub for the Study of Health and Age Related Conditions (IhSHA), led by the Faculty of Science, Engineering and Computing 2. The Centre for Health & Social Care Research (CHSCR), based in the Faculty of Health, Social Care and Education, which is run as a joint venture between Kingston University and St George's, University of London <p>IhSHA addresses biomedical and technological questions towards the maintenance of health, disease processes and diagnosis, and therapeutic interventions in the following areas: diabetes and cardiovascular pathologies (Hill, Hoppe, Naughton); cancer (Naughton, Sim E, Shi); infection and immunity (Karlyshev, Lawton, Sim E, Snyder, Walker); vision, cognition and neuroscience (Hill, Hoppe, Ryan), drug discovery, (Arrigoni, Naughton, Reid, Ryan, Sim E, Sim R, Snyder) and nutrition and public health (Petroczi, Naughton). IhSHA benefits from its close location to internationally recognized organizations such as GlaxoSmithKline (GSK) and Laboratory of the Government Chemist (LGC) Ltd.</p> <p>CHSCR addresses questions generated by the practice of nursing and rehabilitation on health promotion, treatment and care for patients with long term conditions (including musculo-skeletal conditions, stroke, dementia and mental illness) and their carers (Drennan, Grant, Hurley, Ross,), and associated workforce development issues (Chambers, Drennan, Grant). Research is applied to clinical practice and informed by the social sciences and biomedicine. The Centre benefits from co-location with St George's NHS Hospital Trust, close relationships with the National Health Service (NHS) and other healthcare providers and participation in the South London Academic Health Science Network (AHSN) and the NIHR Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for South London.</p>
<p>b. Research strategy</p> <p><i>Achievement of Strategic Research Aims 2008-2013:</i></p> <p>In RAE 2008, the two Centres were submitted to separate UoAs. Since 2008, the collective achievements of the Centres include:</p> <ol style="list-style-type: none"> 1. Growth in research investigating questions of importance to biomedical science, the public, services and policy makers, evidenced by increased research income from national and international funding bodies (d, below); 2. Growth in impact and reach of the research, evidenced by increased outputs in international journals and use of research by policy makers, services, clinical professionals and public bodies, nationally and internationally (REF 3a/b for impact statement and case studies); 3. Increased research leadership. New research leaders have been appointed (Profs Hurley, Karlyshev, Reid, Sim E, Sim R) and two further staff (Petroczi, Walker) promoted to Personal Chairs. These appointments and promotions have increased leadership, sustainability and excellence in the Unit, particularly in human pathogen research, drug action/development, rehabilitation, social cognition and inter-professional and nursing workforce research;

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4. Establishment of the IhSHA and investment in infrastructure and facilities (d, below; ~£40M spent in the past decade) to offer state-of-the-art equipment in modern laboratories dedicated to allied health professions and pharmacy research;
5. Increased QR investment in doctoral studentships (total 20) awarded in the Unit (c(ii), below);
6. Increased international collaborations (e, below) with over 120 active external partners of which more than 50 are international, spanning more than 30 countries.

Future Strategic Research Aims 2014-2019:

In the next five years, the Unit aims to build significantly on the research achievements outlined above. The objectives of the Unit are to:

1. Promote and expand internationally excellent/world leading basic and applied multidisciplinary research within life and health sciences, nursing, and rehabilitation sciences;
2. Maintain focus on research, encompassing diagnostics, drug development for disease, disease mechanisms and infection, health care, nursing and rehabilitation;
3. Increase externally funded research and PhD student completions;
4. Develop new and strengthen existing national and international collaborations with industrial partners to identify impact driven research and enterprise activities;
5. Increase public engagement and involvement in research.

Mechanisms for Achievement 2014-2019:

To meet these objectives, the Unit will continue to take a multi-faceted approach. Appointment of replacement academic staff (c(i), below) will be made rapidly in areas of strength to build capacity; strong recruitment to taught under/postgraduate provision enables this (Objectives 1, 2). Postdoctoral funding will be provided (c(ii), below) and allocated competitively to projects demonstrating high chances of success and potential to deliver impact and/or outstanding research outputs (Objectives 1, 2).

Staff development opportunities will continue to be provided (c(i), below), enabling emerging researchers to develop into independent leaders. Unit funding will continue to be targeted strategically. For example, sabbatical funding will be deployed to help staff achieve clear research goals and PhD funding will be provided (Objective 3). The Unit has seen an increase in grants awarded from funders that are highly competitive (e.g. British Heart Foundation, NIHR, MRC, and EU) for both postdoctoral and postgraduate research. To further external research income (Objective 3), Unit researchers are now expected to submit more applications per year, with time for this allocated via appraisal and outcomes monitored; Unit/Faculty-funded sabbaticals are also used for grant writing. Together with fostered collaboration (below) these measures will increase award success. Bidding for research funding through third-stream activities such as Knowledge Transfer Partnerships will be expanded.

Collaboration (Objective 4) is important to the Unit's success. Internal links will be enhanced through networking events like research days and interdisciplinary research seminar series, and targeted pump-priming funding to foster interaction. Collaboration within Faculties between Unit researchers, engineers, mathematicians and computer scientists will be promoted to heighten blue skies and applied research to increase impact and capacity. Collaborations with health care organisations, industry and universities across South London in the AHSN, where **Ross** has been seconded part-time as a Director, will be built on, as will those in applied nursing and therapy research through the NIHR CLAHRC. Funding for collaboration between partners in the South West London Academic Network (Kingston University, St George's, University of London (SGUL)

Environment template (REF5)

and Royal Holloway, University of London) has been achieved through pump-priming partnership grants and joint studentships; similar funding will continue to provide interactive projects between the three partners. Finally, staff will continue to be supported financially to initiate collaborations with researchers at hospitals, companies, universities, and research institutes nationally and internationally to further impact (Objective 4).

Staff development funds will continue to support collaboration (e, below) to facilitate innovative, high quality research. And monies are channelled into facilities (d, below) to support leading experimental work in biomedicine, nutrition, pharmaceuticals, and health improvement. Public engagement (Objective 5) is a strategic priority, where the Unit intends to build on existing strengths. The Centre for Public Engagement (CPE), based in CHSCR, is strongly involved in public/patient involvement in nursing and health research, whilst lhSHA contributes to public understanding of science through open days and monthly Café Scientifique meetings. The impact from the research on service user involvement in this field is evidenced by the case studies on self-management (Bridges) and the lived experiences of detained patients in Finland. (Objective 5)

c. People, including:**i. Staffing strategy and staff development**

The staffing strategy links to the University's aim of developing an inclusive and supportive environment to nurture and attract future research leaders through its commitment to the Athena Swan Charter. The staffing strategy ensures that each Centre has a mix of senior and junior staff and that the career development of all staff is supported through personal development plans. The lhSHA currently hosts eight postdoctoral research assistants/fellows. Over the review period, CHSCR has hosted three research fellows, an NIHR funded clinical lecturer and management research fellow, a post-doctoral fellow in nursing, and 15 research assistants.

Appointment and Development of New Academic Staff:

The priorities when appointing academic staff to the Unit are international quality of published research and fit to Centre research foci (Objectives 1, 2, b, above). Most new staff arrive with significant research expertise and are afforded the time necessary to enable research development; this is also the case for early career researchers (e.g. **Lawton**). New staff members are provided an academic mentor, monies for consumables and small equipment items, and free access to all facilities including centralized resources such as microscopy, instrumentation and NMR suites. New staff are supported to apply for research grants and are considered favourably when studentships are allocated. The University provides training for teaching and learning, and compulsory training for postgraduate student supervision. These approaches help integrate new staff and encourage research excellence at an early stage.

Sustainable Academic Staff Career Development:

Research progress and career development is appraised against agreed targets. External activities (e.g. grant/journal reviewing, editing, policy committee work) are considered vital to engagement with the broader research base and are strongly encouraged (e, below). All staff can apply for sabbaticals with priority given to those with demonstrable research outcomes; the Unit has awarded five sabbaticals in the review period. Conference presentation/skill enhancement is also encouraged and University funding supports this. Promotion to Reader or Professor is considered annually by the University and is supported by international peer review with international research excellence/recognition the key criterion. That the strategy works is evidenced by the fact that since 2008 the Unit has seen several staff promoted to Readerships and Personal Professorial Chairs (e.g. **Petroczi, Snyder, Walker**). In addition, in the past year four staff in the Unit have been awarded prizes/medals for their contributions to research (e, below). Finally, the 19 staff submitted in this Unit have published over 320 separate research papers in the assessment period, demonstrating sustained activity and development.

Research Staff Career Development:

Research Assistants participate in career development activities and are integrated into the academic framework to broaden their expertise. When academic appointments arise, researchers are encouraged to apply; during the assessment period seven research assistants have been appointed to permanent academic or senior technical posts. Other research assistants have obtained more senior positions elsewhere (e.g. 3 at Kings College London, 1 at each of the Institute of Child Health, Royal Holloway, University of London, and University of Sheffield).

Succession Planning:

Planning ensures retirements/resignations do not disrupt existing operations while also offering scope for quality enhancement and renewed research thrust. Several appointments of new, research active academic staff (e.g. **Hurley, Lawton, Snyder**) have been made during the assessment period to replace members that have retired or moved elsewhere. Other posts (**Reid, Ryan, Shi, Sim E, Sim R**) were in response to expansion. Often, previous staff members retain Unit collaborations, and Emeritus Professors continue to build their research in the Unit providing expertise and mentorship for junior staff.

Context for the NHS/NIHR:

Additionally, CHSCR is a leading training centre for the Department of Health and NIHR Clinical Academic Careers Framework for nurses, midwives and allied health professionals. Two NIHR contracts of over £2million (2009 and 2012) have trained a cadre of health professionals with excellent academic outcomes (100% completions and 8 distinctions) in the Masters in Research (clinical practice). CHSCR has also successfully supported NHS staff to NIHR academic career training fellowships, and has achieved an NIHR funded clinical lectureship in physiotherapy (2010-5) and a NIHR (Health Service and Delivery Research programme) management research fellow (2010-2013) seconded from St. George's Hospital Trust. Over the review period, 8 staff have been NIHR Faculty members.

ii. Research students

In the assessment period, 40 Unit research students have been awarded doctoral degrees. In addition, a further 14 students have been awarded Masters by Research (MScRes) degrees. Currently 148 Doctoral students are registered in the Unit, 99 in IhSHA and 49 in CHSCR. Doctoral students are supported through externally funded research contracts and competitively awarded internal funding: in addition, five internal MScRes bursaries have been granted during the review period. The Unit continues to attract self-funded PhD/MScRes students onto innovative projects, and students who obtain funding in their own right from sources including their national governments. The over-riding criterion used to appoint research students is academic quality. Students are supported through effective and structured training, informed by Research Council guidelines, that ensures their professional development (below).

Research Student Management and Supervision:

All Unit research students must pass initial and annual monitoring. In addition to the Director of Studies (DoS), at least one further supervisor is required per student/project. If a DoS has not previously supervised a research student they are required to attend university training to facilitate proper supervision: the supervisory team must have at least one PhD completion. The first formal independent assessment of progress (substantial written report and *viva voce*) occurs within 12 months and full-time PhD students must submit their thesis within four years of registration, with monitoring occurring each year by means of a student-written report.

Research Student Training and Personal Development:

The University Graduate Research School offers generic research student training providing core multidisciplinary and transferable skills (e.g. ethics, intellectual property, personal development portfolio planning, thesis writing skills) and acts as a centre for support/guidance. Discipline-specific training is provided within the Unit, and to further facilitate training a local Doctoral School has been formed (2011). Postgraduate student co-ordinators arrange regular seminars for students in the Unit and CHSCR students regularly attend/present at St George's, University of London

Environment template (REF5)

seminars and conferences. Students receive training in specific skill sets from academics, or technical/other research staff delegated to support them. Students can demonstrate in undergraduate laboratory classes/tutorials, and training is provided. Training/personal development is assessed during Annual Monitoring (above). Research students are required to present at internal seminars and the Annual Research Student Symposia, and are financially supported to present at national/international conferences. Unit research students attend the collaborative doctoral summer school held between Kingston University, St. George's, University of London and Roehampton University. In addition to this in-house training environment, many students receive further support/training through collaboration with hospitals, companies, universities, and other institutes (e, below). A Unit member Chairs the University Research Ethics Committee, which provides guidance on student development for ethics procedures.

Research Student Culture:

Research students are provided desk space and IT equipment in communal research offices to foster interaction, collaboration and discussion; this enables exchange of ideas and integrates researchers into the wider research-base. Additionally, social and communication (seminar) space exists in the form of three Graduate Centres open to research students from all disciplines, fostering further interaction. The Doctoral School also houses research student seminar and group discussion workspaces. Kingston and St George's students registered in CHSCR are full members of SGUL Graduate School and use the Medical School library. All research students have substantial IT backup and can access diverse equipment, databases and expertise. Clusters of research laboratories (d, below) focus students in areas dedicated for research, where knowledge exchange takes place between students, other researchers, technical staff and academics. The need to do research that is internationally competitive is instilled through student support/training. This serves to deliver successful completions and publications, enabling students to move on to careers at institutions such as Imperial College, University College London, University of Oxford, and the Wellcome Trust.

Research Student Feedback:

Student feedback through supervisory teams is augmented through postgraduate/postdoctoral research meetings chaired by a student representative who feeds back to the Research Degrees Committee. The Tutor for Postgraduate Researchers serves as an additional feedback vehicle. Feedback to the University occurs via these mechanisms and the annual postgraduate research student survey. Thus significant structures exist for communicating student-led ideas.

d. Income, infrastructure and facilities**Research Income:**

There has been a steady rise in research income to the Unit during the assessment period, with income in 2012-13 70% greater than that received in 2010-11.

IhSHA:

Research funding during the assessment period has been secured from various competitive sources as detailed in REF4b. Proposals have been funded by agencies including the World Anti-Doping Agency (WADA), Environment Agency, British Academy, British Heart Foundation, BRIGHT Charity, Insulin-Dependent Diabetes Trust, British Association for Cancer Research, Diabetes UK, SPARKS charity, Boehringer Ingelheim UK, Technology Strategy Board (TSB), Organix Foundation, Teva UK Ltd, GlaxoSmithKline (GSK), Laboratory of the Government Chemist (LGC) Ltd, UK Research Councils including the MRC (National Prevention Research Initiative) and EU FP6. Unit members also hold collaborative grants elsewhere that are not therefore recorded in REF4b; notable awards include RCUK Fellowships in Pharmacology and a Wellcome Trust project grant (**Sim E**) that bring benefit to the Unit through collaborative research.

Support in kind (~£0.5M) includes data sharing and gifts of facilities (e.g. database access from the LGC Ltd & UK Sport; LC MS/MS from GSK). As indicated by the awarding bodies, externally

Environment template (REF5)

funded research within lhSHA supports basic research and research with a translational focus. Studies commissioned by organizations such as WADA and the TSB have supported research with impact (see REF 3a/3b). QR/RDP (formally PGR) funding to the Unit (~£0.6M pa) has bolstered research through provision of over 15 studentships, 5 sabbaticals, conference funding, open access publishing and support of postdoctoral researchers.

CHSCR:

Achievements are evidenced by increased research income in the period (REF4b) from national and international government bodies (NIHR and EU government), UK research councils and charitable organisations. Amongst awarded grants during the period, CHSCR researchers have been principal investigators or co-investigators on 13 NIHR grants including an NIHR programme grant investigating evidence for practice in dementia care in the community. Grants held in other universities (e.g. from the Physiotherapy Research Foundation and Arthritis Research UK, **Hurley**), although not recorded here, serve to enhance research collaboration. This includes funding via St. George's – as CHSCR is based in a Faculty that is a joint venture, income is shared between the two Institutions. Many CHSCR awards support research with a clinical/translational focus also resulting in impact (see REF 3a/3b). QR/RDP funding to CHSCR has been deployed in similar ways to that for the lhSHA (above).

Research conducted jointly with colleagues in Units of Assessment 11 and 15 on Ambient Assisted Living has recently received support from the EU (BREATHE).

Boosting research income further is a Unit priority, highlighted as Objective 3 (b, above).

Infrastructure and Facilities:

A significant proportion of the University's building programme continues to be focused on the health, life and social sciences, with the Unit being a key beneficiary. One building (2001, £10M) provides research space that includes extensive modern synthesis facilities, instrumentation suites, physiology/biomechanics/blood analysis laboratories, biomedical laboratories, microscopy suites, and research student offices. A further building (1995, £3.5M) supporting life sciences research houses separate modern research suites for pathogen research, molecular microbiology/GM, tissue culture, natural products analysis, cell signalling, histology, immunology, and microscopy/image analysis. In addition, a new building (2008/9, £20M) comprising 65 lecture/seminar/conference rooms has enabled other spaces to be re-purposed for research/teaching across the life/pharmaceutical sciences; these include a biotechnology and molecular biology suite (2011/2, £0.5M), NMR suite (2010, £0.5M), several tissue culture facilities and further molecular laboratories (2009/10; ~£1.5M) for allied health profession and pharmaceuticals research. A bid for a new interdisciplinary research laboratory was successful (2013/14, £1.8M) and will incorporate tissue culture facilities, proteomic and chemistry laboratories, a microscopy suite and a bioinformatics core. This will complement existing resource and provide extra research facilities for the lhSHA.

Substantial additional laboratory space and computational and engineering equipment exist elsewhere in the University and are being developed to foster new interdisciplinary collaboration between Allied Health Profession researchers, engineers, mathematicians and computer scientists. Unit members can also use the newly opened Clinical Research Facility at St George's, University of London, which is of benefit to the Unit's clinically orientated research, particularly in CHSCR. Thus considerable infrastructure exists to expand interdisciplinary research, important to Objectives 1 and 2 (b, above). Further afield, Unit scientists have access to wide-ranging complementary state-of-the-art equipment at Royal Holloway and St George's, University of London, through a reciprocal research equipment arrangement.

Funds from CIF during the assessment period, along with previous monies from SRIF and other HEFCE capital expenditure (totalling over £4M in the last 10 years) have enabled sustained improvement of research facilities. Improvements comprise laboratory refurbishment and new build (above) housing new major equipment including among other instrumentation 400 and 600 MHz

Environment template (REF5)

NMR Bruker spectrometers, ICP-MS, ICP-AES, 3 x LC-MS/MS, 2 x GC-MS, laser infrared microscope, laser Raman spectrophotometer, X-ray diffractometer, high-resolution microscopes (SEM, TEM, CLSM), flow cytometers/FACS, BodPod, protein synthesis equipment, and Ion-Torrent sequencer (equipment acquisitions totalling in excess of £2.0M). Equipment donations over the assessment period are valued at ~£0.5M and include LC-MS/MS, MS/MS, incubators, microscopes, PCR and other instrumentation. All smaller items of equipment are state-of-the-art and are replaced on a rolling capital equipment programme.

Governance and planning for research infrastructure and facilities is conducted through large equipment user and planning groups. Within the Unit, core facilities are operated wherever possible to enable broad usage. Cohesion in the Unit's research makes structured facilities planning viable, so that maximum benefit is gained from facilities and infrastructure resources.

e. Collaboration or contribution to the discipline or research base***Support for Research Collaboration and Inter-Disciplinary Research:***

Both of the Unit's centres have interdisciplinary foci and membership. The Unit's research strategy has fostered the development of collaborative research, enhanced by: 1) assisting new staff to retain links with their former institutions (e.g. by provision of research studentships); 2) Knowledge Transfer Partnerships and other associated activities; 3) funding for conference visits/academic exchange; 4) networking activities and conference organization; and 5) sabbaticals for new and established staff that are awarded based on research deliverables (c(i), above). In addition to these local mechanisms, staff members are supported in their efforts to achieve travel grant and collaboration awards from external funders such as the Royal Society. A number of funded collaborative projects have been established with St George's and Royal Holloway, University of London, through the South West London Academic Network (SWaN) to enhance knowledge exchange and foster research between the partner institutions. That the on-going strategy is effective is evidenced by the number of collaborative projects from staff submitted in this Unit. Over 120 active external collaborations have been developed, over 50 of which are with international partners spanning institutions in more than 30 countries; many are identified on the submitted publications which demonstrate the breadth of the Units research and its far reaching interactions with disciplines such as medicine, health economics, sociology, and psychology. Many Unit staff members have Honorary posts to facilitate international research collaborations with other institutions (e.g. visiting Professorial and research appointments in Universities in South Africa (**Chambers**), Hong Kong and Japan (**Ross**)). Because research programmes are actively enhanced through interaction, collaboration remains at the heart of the Unit's research strategy (Objective 4, b, above).

Other Contributions to the Wider Research Base:

Unit members also engage the wider national and international research base through conference contributions, peer review, editorial board memberships and committee work for grant agencies, learned societies and policy providers. In the assessment period, members have presented their research at over 130 international conferences in the UK and overseas, many of which were invited and some of which have resulted in enhanced collaboration. Examples of international journal peer review include reviewing for Nature Nanotechnology, British Journal of Cancer, British Journal of Pharmacology, Cardiovascular Research, Genome Biology, BBA Molecular Cell Research, Immunology, Infection and Immunity, PLoS Medicine, PLoS Neglected Tropical Diseases, Journal of Clinical Microbiology, International Journal of Nursing Studies, Journal of Inter-professional Care and New England Journal of Medicine.

Grant reviewing by Unit members for research councils and charities is considerable and contributes significantly to the business of agencies such as the Wellcome Trust, Nuffield Foundation, Kidney Research UK, British Heart Foundation, Grant Agency of the Czech Republic, Netherlands Organisation for Health Research and Development, CNRS (France), Leverhulme Trust, Arthritis Research UK, National Science Foundation (USA), Australian Research Council, National Health and Medical Research Council (Australia), Howard Hughes Medical Institute

Environment template (REF5)

(USA), Swiss National Science Foundation, NHS R&D Programme National Directorate, NIHR Central Commissioning Facility, NIHR Health Services and Delivery Research Programme, EPSRC, BBSRC, and MRC.

Unit members also hold editorial positions on ~25 international journals where they influence editorial policy and journal development. Examples include British Medical Bulletin, Biomarkers (**Sim E**-Commissioning/Associate Editor); British Journal of Pharmacology (**Sim E**-Board); Parasites & Vectors (**Walker**-Section Editor and Board); Asian Pacific Journal of Tropical Medicine, Advances in Life Science (**Karlyshev**-Board); Chemistry Central Journal (**Naughton**-Board); Physiotherapy, and Arthritis Care and Research (**Hurley**-Associate Editor); Protein and Cell, and Immunobiology (**Sim R**-European/Section Editor); International Journal of Nursing Studies (**Harris** Associate Editor); Journal of Interprofessional Care (**Ross** Consultant Editor); Journal of Advanced Nursing (**Drennan** – Editorial Board).

Finally, several Unit staff members hold positions on grant/policy/society committees enabling them to influence decision-making that impacts on science and society. Notable examples include 'Making Sense of Science' (Wellcome Trust) and Malacological Society (President) (**Walker**); WADA Prevalence of Doping Working Group (**Petroczi**); European Food Safety Authority (EFSA) External Review Group (Chair) and National Measurement System Government Chemist Group (**Naughton**); UK Clinical Research Networks (**Drennan**); Arthritis Research UK Fellowships Committee (Vice Chair) and National Institute for Health and Clinical Excellence (**Hurley**); NIHR Health Services and Delivery Research Board (**Drennan, Ross**); INSERN expert panel, MRC College of Experts, Norwegian Research Council (**Sim R**); MRC Molecular and Cellular Medicine board, EU FP7 Infectious Diseases, MRC Doctoral Training Centre panel (Chair), and Medicines and Health Regulatory Authority Expert Review Panel (**Sim E**).

Recent medals/awards received for contributions to the research base include the J R Vane Medal from the British Pharmacological Society (**Sim E**), the European Complement Medal (**Sim R**), the WH Pierce Prize from the Society for Applied Microbiology (**Snyder**) and the Royal College of General Practitioner prize for the research paper of the year (**Drennan**). The Unit also has one Fellow of the Royal Society (**Reid**).

Relationship with Industry, the Public Sector and Other End Users:

The relationship of the Unit's research with industry and the public sector is strong and is fostered through active research collaboration and translational research activities (above and REF 3a/3b). Several links with NHS partners exist, augmented through additional work with medical schools, particularly in London. In addition, the Kingston and St George's joint venture is one of only seven education providers of the NIHR fully funded Masters by Research in Clinical Practice, a key lever in the national strategy to strengthen clinical research capacity in the NHS. Relationships with other national/international government organizations and agencies are wide-ranging and include the Ministry of Defence, AHVLA, WADA, UK Sport, EFSA, Ministry of Defence Australia, Natural History Museum (London), LGC Ltd, British Poultry Council, DSTL Porton Down, Health Innovation and Education Cluster, and the Institute for Cancer Research (REF 3a/3b).

Relationship with industry spans many sectors; examples of collaborative projects and advisory work within the Unit include those with Vantix Ltd, TwistDX and Bernard Matthews (microbial detection); GSK (oral health, drug development), Boehringer-Ingelheim (cancer therapeutics), Essilor International (vision research), Pfizer and Endue Cosmetics Limited, Sequenom Inc, Veridex, Smiths Detection, Clinical Trials Services Ltd, Molecular Partners AG, Isis Pharmaceuticals, and Summit Plc. Many relationships have led to research with impact (REF 3a/3b). The Faculty/Unit has been successful for a second successive year in obtaining over €0.3M to fund the Enterprise Europe Network (EEN) to foster further collaboration with and between EEN partners and industry.