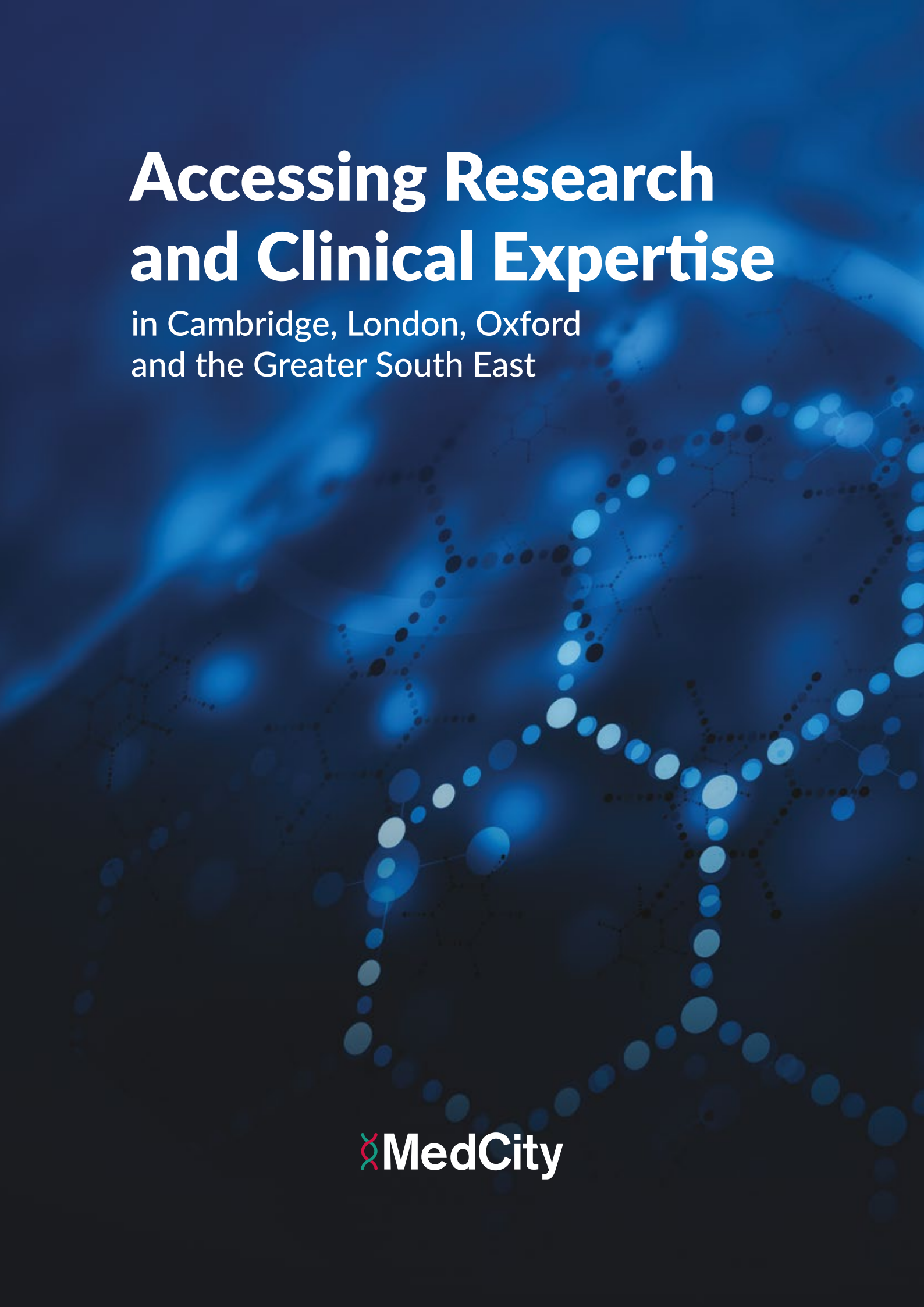
Accessing Research and Clinical Expertise

in Cambridge, London, Oxford and the Greater South East



MedCity

About the NIHR

NHS
National Institute for Health Research

nihr.ac.uk
@officialNIHR

The National Institute for Health Research (NIHR) is funded by the Department of Health to improve the health and wealth of the nation through research. Since its establishment in April 2006, the NIHR has transformed research in the NHS. It has increased the volume of applied health research for the benefit of patients and the public, driven faster translation of basic science discoveries into tangible benefits for patients and the economy, and developed and supported the people who conduct and contribute to applied health research. The NIHR plays a key role in the Government's strategy for economic growth, attracting investment by the life-sciences industries through its world-class infrastructure for health research. Together, the NIHR people, programmes, centres of excellence and systems represent the most integrated health research system in the world.

About NOCRI

NOCRI
NIHR Office for Clinical Research Infrastructure

nihr.ac.uk/nocri
@NIHR_NOCRI

The NIHR Office for Clinical Research Infrastructure (NOCRI) helps public, charity and industry research funders work in partnership with NIHR infrastructure and to maximise the impact of the Department of Health's £0.5b/year investment in clinical research infrastructure.

Equally, it ensures that NIHR-supported centres, units, facilities and networks can work together to help drive the flow of innovative research for patient benefit. NOCRI supports research partners by:

- Research signposting - help with navigating the clinical research environment and finding expert researchers and world class facilities and technologies
- Research collaboration management - support for the development of collaborative research partnerships

About MedCity

MedCity

medcityhq.com
@MedCityHQ

MedCity exists to promote and grow life sciences investment, entrepreneurship, collaboration and industry in London, Cambridge, Oxford and the greater south east. From drug discovery to devices, diagnostics and digital health, MedCity supports life sciences and healthcare companies large and small to do business in the golden triangle.

Launched in April 2014 by Imperial College Academic Health Science Centre, King's Health Partners, UCLPartners and the Mayor of London, and in collaboration with the University of Oxford and Cambridge University; MedCity promotes life sciences in the region by:

- Providing a single front door and concierge service for industry and investors looking for partners, infrastructure and expertise
- Facilitating and supporting collaboration across all parts of the sector to turn innovation into commercial products and services
- Fostering an environment that supports and encourages entrepreneurialism
- Raising awareness globally of the region's rich life sciences ecosystem

Foreword

The golden triangle of Cambridge, London and Oxford is home to world-class scientific research and ground-breaking medical innovations, which benefit not only the surrounding communities but also have global reach. With five out of seven of the UK's academic health sciences centres, this region is uniquely positioned to stimulate collaboration and enable the successful translation of pioneering medical treatments, therapies and technological developments.

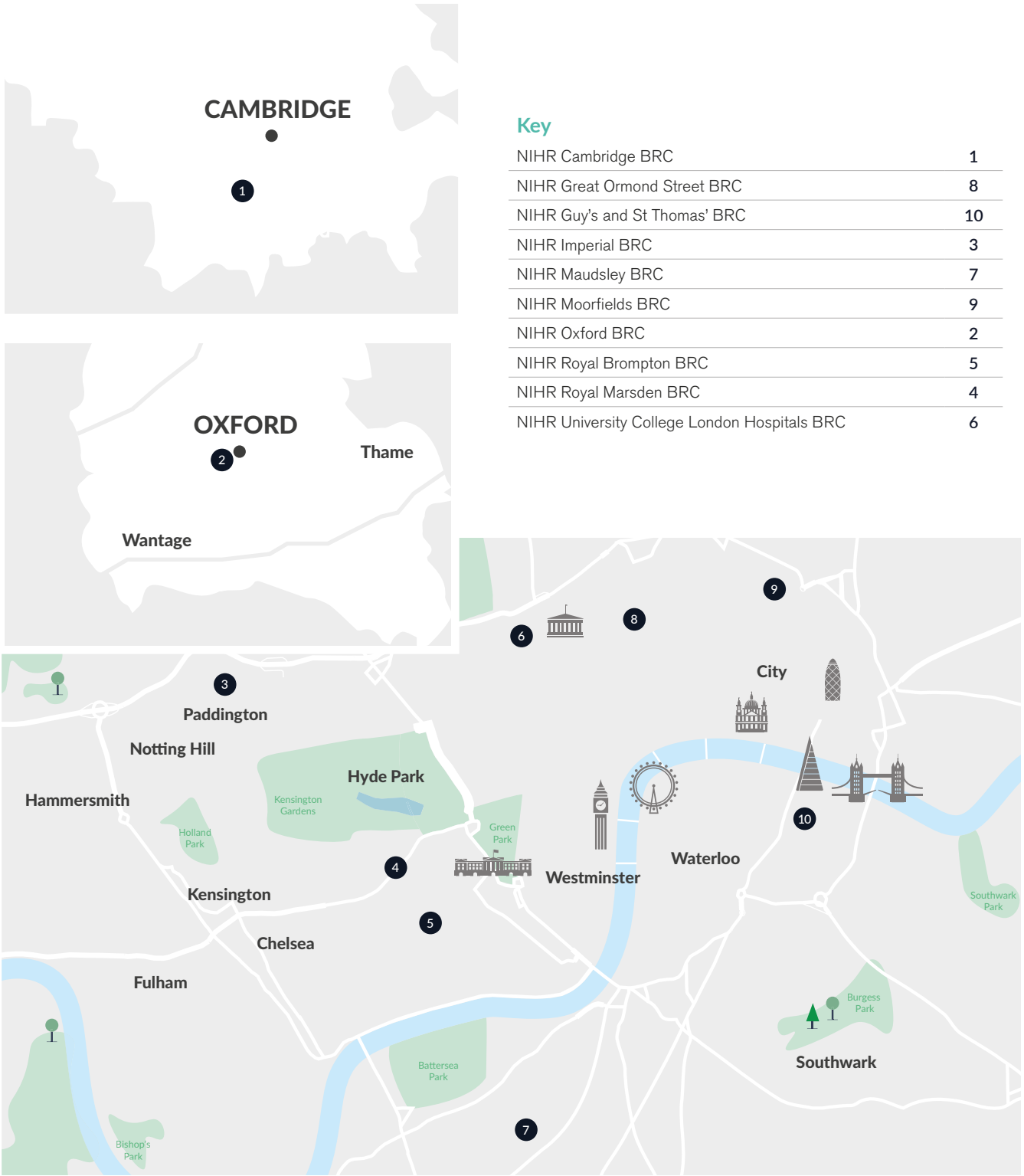
Fundamental to the research success of the region are the **National Institute of Health Research (NIHR) Biomedical Research Centres (BRCs)**. The BRC objective was established in England in 2007 as a way of partnering academic institutions and NHS trusts, with the goal of translating advances in biomedical research into benefits for patients. Working across some of the most challenging disease areas including oncology, immunology and neurology, many of these centres have conducted a number of world-first studies that have led to significant breakthroughs. The centres were formed in 2012, ten of which are located in the greater south east of England and collectively received nearly £700 million of funding from the NIHR.

In a new round of funding, the NIHR has awarded a record £816 million to fund NIHR BRCs for a further five years, beginning on 1 April 2017. Twenty centres were successful in securing funding, including those in the Golden Triangle of Cambridge, London and Oxford. This brings with it a wave of anticipation and excitement of not only the translational potential of new drugs and medical products, but also the ability to increase collaboration, further engage the local community and improve public and global health.

This brochure showcases the capabilities of the biomedical research centres as well as highlighting examples of their innovations and research.

Sarah Haywood
CEO, MedCity

NIHR BRCs in Cambridge, London and Oxford



Key

NIHR Cambridge BRC	1
NIHR Great Ormond Street BRC	8
NIHR Guy's and St Thomas' BRC	10
NIHR Imperial BRC	3
NIHR Maudsley BRC	7
NIHR Moorfields BRC	9
NIHR Oxford BRC	2
NIHR Royal Brompton BRC	5
NIHR Royal Marsden BRC	4
NIHR University College London Hospitals BRC	6

NIHR Cambridge BRC

The NIHR Cambridge Biomedical Research Centre is based on the Cambridge Biomedical Campus. The campus combines on a single site, scientific research in world-class institutes, patient care in NHS hospitals, and drug discovery in pharmaceutical companies including AstraZeneca and GlaxoSmithKline.

Important local partners are Papworth Hospital, Cambridgeshire and Peterborough NHS Foundation Trust; a specialist mental health service provider, the Wellcome Trust Sanger Institute; a world leader in genome research, and the European Molecular Biology Laboratory - European Bioinformatics Institute; which works with scientists to analyse and understand complex sets of health data.

The BRC has outstanding research facilities for a broad range of areas including; genetics and genomics, imaging, informatics and population science. The centre has expertise in translational research in all therapeutic areas as well as in transplantation and the use of stem cells to repair tissues.

The Cytosponge

Cancer of the oesophagus is the eighth most common cancer and fifth leading cause of cancer death globally. A pre-invasive lesion, Barrett's oesophagus, offers the possibility of early intervention in individuals with reflux symptoms (Vaughan TL & Fitzgerald RC, Nat Rev Gastroenterol 2015), but dyspepsia affects between 5%-20% of the population and accounts for up to 10% of GP consultations in the UK.

Rebecca Fitzgerald (NIHR Research Professor) has developed a non-endoscopic diagnostic test for Barrett's oesophagus, which involves a 'cytosponge' combined with molecular biomarkers including the Barrett's specific biomarker TFF3. The cytosponge is a sponge within a capsule on a string. Once swallowed, the capsule dissolves, the sponge expands, and collects oesophageal cells as it is withdrawn. A rigorous phased approach has evaluated the safety, acceptability, sensitivity and specificity of the Cytosponge™-TFF3 test (Ross-Innes CS et al, Plos Med 2015). In addition, using the same Cytosponge, sample patients can be stratified according to their risk for cancer using a panel of 3 molecular biomarkers (Lancet Gastro & Hepatol 2016). Furthermore, sequencing studies have confirmed that the Cytosponge samples the entire clonal architecture, thus minimising the sampling bias inherent to endoscopic biopsies (Nat Gene 2015). In a microsimulation model, the new test costs an additional $240 per screening participant, compared with no screening, and results in a mean gain of 0.015 QALYs and an ICER of $15,700 per QALY (Benaglia T, Gastroenterology 2013).

Development as a CE marked and FDA approved diagnostic has exploited the breadth of NIHR Cambridge BRC expertise, including dedicated facilities for experimental medicine studies involving endoscopy within the NIHR Clinical Research Facility, the Clinical Trials Unit, biostatistics, health economics and technology transfer support. The potential for the Cytosponge to deliver better patient care has been recognised by award of a Department of Health Innovation Challenge Prize and the BMJ Gastroenterology Team of the Year award in 2016.

UNIVERSITY OF CAMBRIDGE

Cambridge University Hospitals NHS
NHS Foundation Trust

NIHR Great Ormond Street BRC

The vision of the NIHR Great Ormond Street BRC is to translate biomedical research into treatments for rare childhood diseases. To achieve this, the BRC works in partnership with industry, academia and the NHS, to expand its ever growing portfolio of commercial studies. The commercial studies currently undertaken at the Trust include clinical trials of new drugs or medical devices, as well as qualitative and non-interventional research.

The GOSH BRC covers a broad range of specialities with research focused around four major research themes: Gene, Stem and Cellular Therapies; Novel Therapies and their Translation into Childhood Diseases; Advanced Treatments for Structural Malformation and Tissue Damage; and Genomics and Systems Medicine.

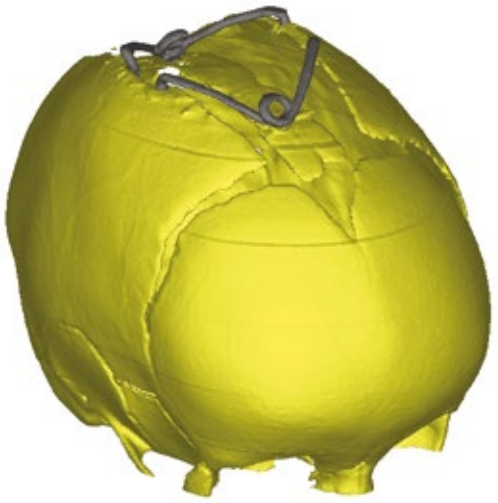
The GOSH NHS Foundation Trust has the greatest number of Highly Specialised Services nationally (19 in total), providing a unique resource to conduct clinical research in rare diseases of children. Facilities include, a dedicated Clinical Research Facility, and support departments enabling a wide range of inter-disciplinary studies

Development of spring-assisted cranioplasty

Mr David Dunaway and Mr Owase Jeelani, together with a group of engineers led by Dr Silvia Schievano and other clinicians at the GOSH BRC have been working in partnership with the leading craniofacial company KLS Martin, Germany to further develop spring-assisted cranioplasty.

GOSH provides a Specialist Craniofacial service that diagnoses and treats complex forms of craniosynostosis and other conditions affecting the skull and face. An engineering group is integrated into the clinical multidisciplinary team, studying the biomechanical effects of procedures/devices on patient skulls, in order to improve and optimise treatments.

Spring-assisted cranioplasty is a minimally invasive surgical approach that allows skull remodelling through the use of metallic springs, temporarily implanted between cranial bones. This technique has been demonstrated to be safe and efficient in treating craniosynostosis, with a reduction in blood loss, transfusion requirement and overall hospital costs, when compared to traditional remodelling surgeries. Spring-assisted cranioplasty was introduced at GOSH over six years ago for correction of craniosynostosis, using pre-formed spring devices and a standardised surgical approach. The spring design was developed at GOSH, with currently three standardised models and over 200 patients who have benefitted from this minimally invasive technique at our centre.



The recently established collaboration with KLS Martin will allow the device to be CE marked for clinical use, produced and distributed for the treatment of infant cranial defects in other countries. Mr Dunaway and Mr Jeelani will be involved in a peer-to-peer programme for training of the clinical centres that will start using this new technology.

The GOSH spring was licensed for use in the correction of sagittal craniosynostosis to KLS Martin in 2015/16. The new device prototypes will be launched by the end of 2017 and will become commercially available in the following year.

UCL GREAT ORMOND STREET INSTITUTE OF CHILD HEALTH

Great Ormond Street Hospital for Children NHS Foundation Trust

NIHR Guy's and St Thomas' BRC

The NIHR Guy's and St Thomas' BRC is a collaboration between one of the largest and most successful hospitals in the UK, Guy's and St Thomas' NHS Foundation Trust, and one of the world's top universities, King's College London. It is part of King's Health Partners Academic Sciences Centre.

As one of only five comprehensive BRCs set up in 2007, this partnership has delivered a step change in the delivery of world leading experimental medicine and advanced therapeutics across all its theme areas. All of the research themes are supported by its world class facilities, and operate through an interdisciplinary cluster structure.

Working with industry to lead the revolution in advanced therapeutics

Over the next five years, the BRC will continue its mission to discover new disease biomarkers, develop novel advanced therapeutics and provides its scientists with cutting-edge infrastructure to support their work.

Its world leading Advanced Therapy Manufacturing Platform with its Good Manufacturing Practice (GMP) Unit provides a flexible space for the production of cell and gene therapies. It is uniquely co-located within the Clinical Research Facility (CRF) at Guy's Hospital and enables the use of Advanced Therapy Medicinal Products (ATMPs) in clinical trials. The BRC is working with a number of international manufacturers to ensure that its work remains at the cutting edge of advanced therapeutics.

A good example of this is the collaboration with Miltenyi Biotec. Within a framework agreement they are working together to develop the MACSQuant® Tyto system for high-speed micro-chip based cell sorting. With this BRC being one of only two locations in the UK to host the MACSQuant® Tyto system, the symbiotic relationship with Miltenyi Biotec allows the company to develop a deeper understanding of the working of a GMP Unit and the needs of scientists in order to help build the market success of their products pipeline.

For this BRC, working on the development of the MACSQuant® Tyto has allowed it to enhance its GMP manufacturing processes to enable delivery of up to 90% specificity in terms of a potency, efficacy and purity of any ATMP required, under the gentlest of conditions; defining ground breaking standards in cell viability and functionality. For precision medicine, this heralds a new era in clinical care and treatment, enabling it to deliver new advanced therapeutics to patients.

In recognition of the outstanding achievements of this BRC and the world class facilities and work of its CRF, the NIHR has awarded Guy's and St Thomas' and King's College London £64.4 million over five years from April 2017, with a further award of £7.3 million to Guy's and St Thomas' CRF, to allow it to continue providing researchers with state of the art expertise, facilities and technology needed to conduct ground breaking experimental medicine studies for the benefit of patients.

KING'S HEALTH PARTNERS

An Academic Health Sciences Centre for London

Pioneering better health for all

KING'S College LONDON

Guy's and St Thomas' NHS

NHS Foundation Trust

NIHR Imperial BRC

The NIHR Imperial BRC has a diverse population of 2.4m patients across NW London. The BRC is highly entrepreneurial and provides well-established services to nurture new industry collaborations and an environment that facilitates rapid commercialisation. Since 2013, it has filed 166 patents, translated 51 new products into clinical studies in over 2000 patients and has been involved in the creation of 19 commercial University spin-outs with its partner, Imperial Innovations plc. The environment also enables rapid idea generation and development via initiatives such as: Translator-in-Residence program, CrowdSolve and Advanced Hackspace. A major focus of its strategy is facilitating personalised medicine through data science, as well as evidence generation enabling integration of Medtech innovation into clinical practice. This will be supported via numerous platforms and initiatives including the Data Science Institute that enables data visualisation, the Centre for Mathematics in Precision Medicine and the NIHR-Diagnostics Evidence Cooperative.

gripAble™: A portable, patient-personalised device improving physical disabilities

Imperial BRC researchers have developed the gripAble™ device to improve arm and cognitive function of patients who suffer arm weakness. gripAble™ is a patented, low cost, digital handgrip that wirelessly interacts with specially designed app-based therapy games. Unlike existing rehabilitation tools, gripAble™ is the only digital handgrip to measure functional hand grasp, grip strength and whole arm movements simultaneously. It has been designed to be portable, patient-personalised and easy-to-use in any environment.

Clinical studies have shown that 93% of patients presenting with arm disabilities could engage with smartphone and tablet assessments when using gripAble™, versus only 55% just using touch screen alone. Maybe more impressively, 83% of severely disabled patients could perform the assessments when using gripAble™ versus 0% of those patients using touch screen alone.

The unique features of gripAble™ have led to numerous awards including an NHS Innovation Prize. Impressively, the initial concept to a patented device was achieved in less than three years.

Impact

Over five million people in the UK live with arm weakness due to stroke and other neurological and musculoskeletal conditions. These physical disabilities require expensive long-term care and the only current intervention improving arm function is limited by its cost and availability of physiotherapists. Unlike other therapies, gripAble™ is low cost and easy to use by patients both in hospitals and at home. As such, gripAble™ could potentially help save the health service millions of pounds.

Next steps

gripAble™ is now being used in both hospitals and at home in longitudinal rehabilitation studies. The gripAble™ design has now been optimised to increase ergonomic comfort, accessibility and sturdiness. The final part of the development stage is to realise the optimised design into an actual product, validate the new features, and to develop a manufacturing mould of the final product, enabling mass production.

Imperial College London

gripable

Imperial College Healthcare NHS Trust

NIHR Maudsley BRC

The NIHR Maudsley BRC work with technology firms, pharmaceutical companies, charities and others to deliver innovative research into mental health, neuroscience, and dementia. Based in a diverse area of south London, its unique cohort of patients and service users is complemented by world-leading research facilities offering advanced neuroimaging, -omics, and informatics.
Its research partnerships – including UK Biobank and IMANOVA – allow it to capitalise further on national and local resources. Together with the Guy's and St Thomas' BRC they are part of King's Health Partners Academic Sciences Centre. In informatics, its Clinical Record Interactive Search (CRIS) system provides regulated, secure access to over 280,000 de-identified electronic health records, underpinned with sophisticated natural language processing capabilities.

The Centre for Translational Informatics provides a vehicle for development, testing, evaluation and implementation of digital interventions in mental health. Together with King's Health Partners' Clinical Trials Office, its Centre for CNS Therapeutics provides a platform for industry collaborations, and allows them to offer comprehensive, streamlined support to clinical trials, including trial management, governance and statistical services.

RADAR-CNS: Using smartphones and wearable technology to monitor depression, epilepsy and multiple sclerosis

Continuous remote assessment using smartphones and wearable devices provides the opportunity for monitoring and self-management of a patient's condition at a previously unachievable level of detail. Moreover, it could potentially allow early diagnosis or treatment before a patient's health deteriorates, post-diagnosis detection of relapse, and improved monitoring of disease progression and prognosis. The programme aims to improve patients' quality of life, and also to develop a scalable and extensible open-source platform for remote assessment of patients that is disorder and device-agnostic, becoming the defacto platform for mobile health studies.

Remote Assessment of Disease and Relapse in Central Nervous System Disorders (RADAR-CNS) is a major international research project aiming to develop new ways of measuring major depressive disorder, epilepsy and multiple sclerosis (MS) using wearable devices and smartphone technology.

Jointly led by Professor Matthew Hotopf, Director of the NIHR Maudsley BRC, and Dr Vaibhav Narayan from Janssen Pharmaceutica NV, the project is funded by the Innovative Medicines Initiative (IMI), a Public Private Partnership set up between the European Federation of Pharmaceutical Industries and Associations (EFPIA) and the European Union.

RADAR-CNS is drawing expertise from 23 organisations across Europe and the US, including researchers from diverse fields including clinical research, engineering, computer science, information technology, data analytics and health services. Key technology partnerships include Intel and the Alan Turing Institute.

In addition to providing co-leadership for the project, the NIHR Maudsley BRC is providing critical expertise in mental health informatics and the clinical disorders being studied. Moreover, its internationally-recognised expertise in patient and public involvement allows us to ensure that the views of people with depression, epilepsy and MS are incorporated into RADAR-CNS, for instance by providing feedback on the layout and content of research materials and providing expert opinions on important decisions to be made in the design of studies.

NIHR Moorfields BRC

Moorfields NIHR Biomedical Research Centre (BRC) is dedicated to vision research. NIHR BRC funding supports its strategy founded on six methodological research themes for research into the major common vision problems (age-related macular degeneration, diabetic retinopathy and glaucoma) as well as rare eye diseases. The BRC continues to prioritise areas where there is unmet patient need and where it has an outstanding track record of translational achievement and expertise at an international level.

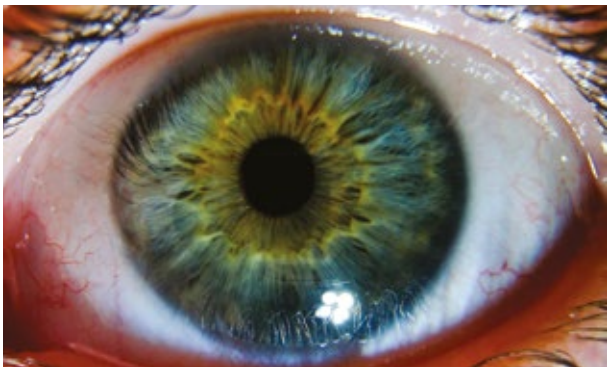
Moorfields BRC is the only BRC dedicated to eye disease. It has built infrastructure around these themes, growing strategic partnerships and collaborations and building capacity to support and consolidate all the links of the translational bridge. As a result, new treatment techniques and practices that improve patient health are being brought through to clinical and surgical practice as quickly as possible, thereby benefiting patients, as well as the NHS, universities and the UK as a whole.

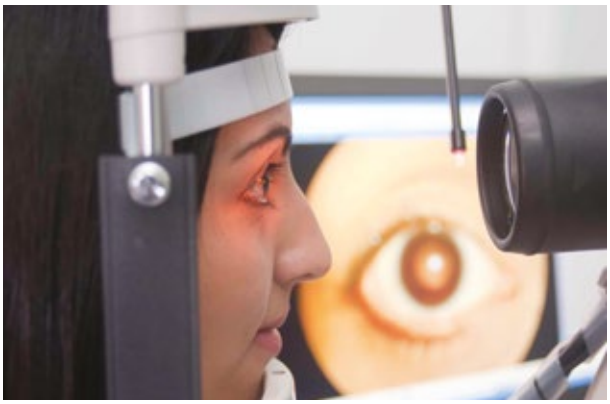
A Therapy For Wet AMD And Other Conditions Where There Is Abnormal Blood Vessel Growth

Moorfields BRC Researchers, Professor Stephen Moss and Professor John Greenwood, have discovered a new molecule called leucine-rich alpha-2-glycoprotein 1 (LRG1) which could hold the key for future therapy of a number of conditions where there is abnormal blood vessel growth, including age-related macular degeneration (AMD), rheumatoid arthritis, proliferative diabetic retinopathy, atherosclerosis and cancer. (Wang X et al. LRG1 promotes angiogenesis by modulating endothelial TGF- Nature 2013 ;499(7458):306-11)

The research team has now received £5.6 million funding from the Medical Research Council to conduct early-phase clinical trials. Angiogenesis – the growth of blood vessels - is essential for normal development and tissue repair but uncontrolled vessel growth can also be harmful when, for example, it supports the growth of solid tumours or when the vessels that form are abnormal and leaky as in the 'wet' form of AMD. Therefore, blocking the activity of LRG1 to prevent the uncontrolled growth or formation of abnormal vessels in these circumstances might help to prevent disease progression.

The researchers discovered that in conditions like wet AMD, LRG1 activity is 'switched on' and this encourages another molecule called transforming growth factor beta (TGF-beta), to shift from maintaining normal, healthy blood vessels towards promoting growth of new disorganised blood vessels. These abnormal blood vessels have a tendency to be thin walled and leaky, which can result in fluid and blood leaking into the eye killing-off cells in the region of the eye called the macular, which causes damage to people's central vision.





To block the activity of LRG1, the research team has employed an antibody, called Magacizumab, which specifically blocks the activity of LRG1, preventing it from causing a switch in the activity of TGF-beta. This results in a decrease in the growth of these dysfunctional blood vessels.

NIHR Oxford BRC

The NIHR Oxford Biomedical Research Centre is a partnership between Oxford University Hospitals NHS Foundation Trust (OUH), one of the largest acute teaching trusts in the UK, and the University of Oxford, a world-leading university for clinical, pre-clinical and health sciences.

The BRC was established in 2007 after successfully bidding for a £57m grant from the NIHR, which was renewed with £98m for 2012 to 2017 and £114m for 2017 to 2022, an investment that will increase the number of research themes from 14 to 20.

Research takes place across OUH's four hospitals, which employ more than 12,000 people and have more than a million patient contacts a year, and dedicated University research facilities that accommodate more than 3,000 researchers.

Research covers a wide breadth of themes including cancer, cardiovascular, diabetes, neuroscience, genomics, infection, surgery and vaccines. From April 2017, this will expand to include obesity, diet and lifestyle and respiratory conditions.

Restoring Eyesight In Patients With Genetic Vision Defects Using Gene Therapy

Pioneering research supported by funding from the NIHR Oxford Biomedical Research Centre led by Professor Robert MacLaren of the Oxford's Nuffield Laboratory of Ophthalmology is helping restore eyesight in patients with genetic vision defects. Choroideraemia is a genetic condition which affects the eyesight of 1 in 50,000 people. Often identified in late childhood, patients struggle to see in low-light conditions, and sight gradually declines until most sufferers lose their eyesight completely by the time they reach middle age. A pioneering technique which involves injecting a virus into the eye to deliver billions of healthy genes to replace a key missing gene for choroideremia sufferers has provided sustained improvement in vision for up to four years for some patients.

This research provides the strongest evidence so far in humans, that the effects of gene therapy are potentially permanent and could therefore provide a single treatment cure for many types of inherited blindness. These include, retinitis pigmentosa, which affects young people, and age-related macular degeneration, which affects the older age group. The gene therapy treatment was designed to slow or stop sight loss, however, two of the patients experienced a significant improvement in vision that was sustained for at least four years, despite a decline in their untreated eyes over this period. A further three maintained their vision in their treated eyes throughout this period. The sixth patient who had a lower dose had a slow decline in vision in both eyes.

Professor Robert MacLaren, the lead investigator of the study, explained: "There have recently been questions about the long term efficacy of gene therapy, but now we have unequivocal proof that the effects following a single injection of viral vector are sustained…sharpening up the little bit of central vision that these patients have can give them considerable independence".

UNIVERSITY OF OXFORD

Oxford University Hospitals NHS
NHS Foundation Trust

NIHR Royal Brompton Cardiovascular and Respiratory BRUs

Many successful diagnostics and treatments have been developed through the long standing research partnership between Royal Brompton & Harefield NHS Foundation Trust and Imperial College London – improving patient heart and lung health.

As the UK's leading specialist heart and lung centre, it delivers clinical research expertise along with access to large patient groups including both common and rare heart and lung conditions.

It attracts collaborations from leading research centres within the UK and beyond, and works with industry partners and charities.

Partners benefit from its research infrastructure, providing: dedicated NIHR Clinical Research Facility; high calibre research teams; and considerable scientific expertise in areas such as imaging, genetics and gene therapy. Its well-resourced facilities include: state of the art cardiovascular MR; genetics laboratories; and specialist lung physiology services.

With its partners, it meets the challenges to provide better diagnoses, and develop and test new treatments – helping deliver improved care to patients in the future.

Novel therapeutics for treating cardiovascular and respiratory conditions

First transcatheter implantation of a novel mitral valve device
A collaboration between experts from the NIHR Royal Brompton Cardiovascular BRU and clinical stage medical device company Tendyne Holdings Inc, led to the first human implants of a novel transcatheter mitral valve implant. The device can be used to replace faulty valves in patients not suitable for open heart surgery.

The Tendyne device is the first of its kind that is suitable for the treatment of patients with mitral regurgitation, which can cause shortness of breath, tiredness, dizziness and chest pain. Left untreated it can lead to heart failure and death.

Industrial particle engineering of respiratory drugs
A collaboration between Prosonix (now Circassia) and the NIHR Royal Brompton Respiratory BRU evaluated how industrial particle engineering of respiratory drug particles may impact on the pharmacodynamics of new respiratory drugs and possibly aid in the development of drugs which are cheaper to manufacture globally, whilst retaining clinical benefits for patients.

Following this collaboration, Prosonix and Imperial College London in collaboration with Kings College and the University of Bath were successful in obtaining a Technology Strategy Board grant of £1.3M to investigate "Smart Combination Respiratory Medicines for Optimal & Cost Effective Patient Benefit", where novel formulations were investigated for their efficacy in a cell model that replicates the airways biology of patients with COPD.

Imperial College London

Royal Brompton & Harefield NHS
NHS Foundation Trust

NIHR Royal Marsden BRC

The Royal Marsden and The Institute of Cancer Research form the largest comprehensive cancer centre in Europe, and its NIHR BRC is the only one specialising in cancer. Its BRC infrastructure is complemented by the NIHR/CRUK ECMC and NIHR Imaging CRF to maximise its translational research. Some of its BRC's key areas are: developing rapidly accessible, reliable and more effective genetic testing for all cancer patients; improving imaging techniques for diagnosis; analysis of therapeutic response and to plan treatments; utilisation of big data approaches; developing new therapeutic technologies, in particular advanced radiotherapy and tissue ablation; and informing patient stratification by designing and evaluating new biomarker platforms. It has an excellent track record in working with commercial partners to translate its research discoveries into patient benefit. Moreover the wealth of its know-how, model systems and analytical tools create many opportunities for companies to interact with them as they seek to accelerate development of novel products and services through to market. For example, its research partnership with Elekta, a leading manufacturer of radiotherapy equipment, to develop MR-Linac technology, is at the forefront of translating the latest scientific and engineering achievements into practical methods. MR-Linac will combine a MRI scanner and a linear accelerator to precisely and constantly image the tumour during radiotherapy and allow the treatment to be adapted in real time, improving accuracy and patient outcomes.

Mainstreaming Cancer Predisposition Gene Testing

Traditionally, few cancer patients could access gene testing because the technology was slow and expensive and the process for accessing it was long and complex. The ICR's track record in discovering cancer predisposition genes led it to form a partnership with Illumina to develop a fast, accurate, affordable test for germline genetic variants of relevance to cancer. This test, known as the TruSightTM Cancer Panel, targets variants from 94 genes, is commercially available and allows much higher throughput and reduced cost. It has accredited the test to ISO15189 standard and 180 labs in 35 countries, including its own laboratory, TGLclinical, use the panel, allowing many more eligible patients to access testing.

Approximately 15% of ovarian cancer patients have a germline BRCA1 or BRCA2 mutation which has substantial implications for their personal management and that of their relatives. Unfortunately, in most countries, routine implementation of BRCA testing for ovarian cancer patients has been inconsistent and largely unsuccessful. In the UK, only 15-30% of eligible patients are being offered testing, primarily due to limited capacity of the gene testing infrastructure, which requires referral to a genetics department. The RM BRC supported development of a rapid, robust, mainstream genetic testing pathway in which testing is undertaken by the trained cancer team with cascade testing to relatives performed by the genetics team. The pathway offers a 4-fold reduction in time and 13- fold reduction in resource requirement compared to the conventional pathway. If this model was rolled out for all 10,000 ovarian cancer patients across the NHS, only 750 genetic counselling appointments would be needed annually for the women with mutations that needed clinical action, and could save the NHS at least £2 million each year. It also showed that implementation for all NHS ovarian cancer patients would cost £4,339 per quality-adjusted life year – far below the £20,000 threshold used to decide what tests and treatments the NHS should offer. Through these innovations it has greatly increased the number of patients that can benefit from testing without increasing costs.

Musician Anastacia and BBC Breakfast's Naga Munchetty visit Professor Naz Rahman to learn about our mainstreaming cancer genetics programme.

The ROYAL MARSDEN NHS Foundation Trust | ICR The Institute of Cancer Research

NIHR University College London Hospitals BRC

The UCL BRC is the result of an outstanding partnership between University College London Hospitals NHS Foundation Trust and UCL. By working together, it has become a leader in translating fundamental biomedical research into clinical research that benefits patients.

With BRC status, it has been able to build on its expertise in areas such as cancer, cardiovascular disease, dementia and neurosciences. April 2017 will see the beginning of a new BRC following an award of over £111 million from the NIHR to extend its groundbreaking research into areas such as mental health; deafness; oral health and obesity.

Tangible results and achievements of the BRC include a 75% rise in the number of new early phase trials approved at UCLH between 2012 and 2016; 8,000 participants recruited to the UCL BioResource initiative; the launch of 'spin out' companies Autolus, Freeline and Achilles; and BRC supported research mentioned in the press over 240 times.

Today's research, tomorrow's medicine

£70m to develop revolutionary T-cell cancer treatments
Researchers secured £70 million to develop T-cell therapies that could revolutionise the way cancer is treated, based on the work of BRC researcher Dr Martin Pule. The team are looking at novel treatments that enable the patient's own immune system to fight the primary cancer and could help the body to better fight secondary cancers. If successful, the approach could open up a new of era of cancer therapies.

Epilepsy drug could prevent nerve damage in MS
BRC supported research found the anti-convulsant drug phenytoin protected neural tissue in patients with optic neuritis. Optic neuritis is a symptom of MS which causes the nerves carrying information between the eye to the brain to become inflamed and damaged. The findings bring researchers one step closer to establishing neuroprotective drugs for people with MS – currently there are none.

New 'spin out' company to develop gene therapies for bleeding disorders
2015 saw the launch of Freeline Therapeutics, a new company to develop gene therapies for bleeding disorders like haemophilia B. The launch of Freeline Therapeutics builds on the success of BRC researcher Professor Amit Nathwani's study into gene therapy as a single treatment for haemophilia B patients by developing next generation gene delivery technology to further enhance therapeutic potential and efficacy.

Bariatric surgery cuts blood pressure and diabetes risk
Researchers supported by our BRC found weight-loss

surgery can significantly improve existing type 2 diabetes and reduce abnormally high blood pressure. The team used primary care records to compare the weight, body mass index and obesity-related illnesses of 3,882 bariatric surgery patients and similar patients who did not have surgery over an average period of three and a half years. The study is the largest comprehensive study of longer-term outcomes post-bariatric surgery in the UK.

UCL

University College London Hospitals NHS
NHS Foundation Trust

Directory of NIHR BRCs in Cambridge, London and Oxford

NIHR Cambridge Biomedical Research Centre
Box 277
Hills Road
Cambridge, CB2 0QQ

Tel: 01223 348 467
Email: jrb1000@cam.ac.uk

NIHR Great Ormond Street Biomedical Research Centre
UCL Great Ormond Street Institute of Child Health
R&D Office
30 Guilford Street
London, WC1N 1DP

Tel: 020 7905 2844
Email: su.jayakody@gosh.nhs.uk

NIHR Guy's and St Thomas' Trust Biomedical Research Centre
Guy's and St Thomas' NHS Foundation Trust and King's College London
Research and Development Department
16th Floor Tower Wing
Great Maze Pond
London, SE1 9RT

Tel: 020 7188 7604
Email: b.sawtell@gstt.nhs.uk

NIHR Imperial Biomedical Research Centre
The Bays
South Wharf Road
St Mary's Hospital
London, W2 1NY

Tel: 020 3312 2563
Email: k.sheehan-rooney@imperial.ac.uk

NIHR Biomedical Research Centre at South London and Maudsley NHS Foundation Trust and Kings College London
PO Box 05
16 De Crespigny Park
London, SE5 8AF

Tel: 020 7848 5485
Email: saliha.afzal@kcl.ac.uk

NIHR Moorfields Biomedical Research Centre
Moorfields Eye Hospital NHS Foundation Trust &
UCL Institute of Ophthalmology
162 City Road,
London, EC1V 2PD

Tel: 020 7566 2816
Email: julian.hughes@moorfields.nhs.uk

NIHR Oxford Biomedical Research Centre
The Joint Research Office
Block 60, The Churchill Hospital
Old Road, Headington
OX3 7LE

Tel: 01865 227 109
Email: vasiliki.kiparoglou@ouh.nhs.uk

NIHR Royal Brompton Biomedical Research Centre
Royal Brompton & Harefield NHS Foundation Trust
Sydney Street
London, SW3 6NP

Tel: 020 7352 8121
Email: j.rivers@rbht.nhs.uk

NIHR Biomedical Research Centre at the Royal Marsden NHS Foundation Trust and the Institute of Cancer Research
Downs Road,
Sutton, SM2 5PT

Tel: 020 8915 6505
Email: cancerbrc@rmh.nhs.uk

NIHR University College London Hospitals Biomedical Research Centre
Research & Development
Maple House Suite A
1st floor
149 Tottenham Court Road
London, W1T 7DN

Tel: 020 3108 7907
Email: m.norton@ucl.ac.uk

Contact us

MedCity can help you navigate and access different parts of the academic, NHS and industrial life sciences and healthcare environment across the golden triangle of Cambridge, London, Oxford and the greater south east region of England.

office@medcityhq.com
0203 179 8100
medcityhq.com

@MedCityHQ