



# HEALTHCARE TECHNOLOGIES

The Healthcare Technologies Institute (HTI) at the University of Birmingham is changing the healthcare landscape. From the laboratory through to clinical trials, our interdisciplinary researchers are developing new bespoke prosthetics, advancing research into new regenerative technologies, formulating dressings to minimise scarring, and developing sensors to allow for the diagnosis of disease sooner. We are supporting healing and striving to ensure people live longer, healthier and happier lives.

## Key messages

- The University of Birmingham is accelerating 21st century innovations to improve healthcare. At present, such technologies can be invasive, unreliable and expensive. Our researchers are working collaboratively to develop ground-breaking sensor technologies and treatments to better diagnose and treat patients for a better quality of life.
- Research at the Healthcare Technologies Institute is conducted in collaboration with University Hospitals Birmingham NHS Foundation Trust (UHB), Medical Devices Testing and Evaluation Centre (MD-TEC) (funded by the European Regional Development Fund (ERDF)), and in partnership with Aston University. Our experts are from a variety of disciplines across the University including chemical engineering, biomedical and clinical sciences, computer science, applied mathematics, chemistry and physics are working together to speed up the translation of new discoveries into health applications.

**THERE IS AN INCREASING DEMAND TO DELIVER NEW TECHNOLOGIES THAT ALLOW US TO MORE RAPIDLY DIAGNOSE AND BETTER TREAT PATIENTS. RESEARCHERS FROM THE UNIVERSITY OF BIRMINGHAM ARE DEVELOPING STATE-OF-THE-ART TECHNOLOGIES TO CHANGE THE HEALTHCARE LANDSCAPE.**



- The University of Birmingham's state-of-the-art facilities at the Institute for Translational Medicine (ITM) will help to boost the life science community in Greater Birmingham and Solihull Local Enterprise Partnership (GBSLEP) by helping SMEs bring products to market quickly and with a reduced cost. We will help accelerate the translation of novel medical innovations in the laboratory through to clinic and commercial exploitation.
- The Healthcare Technologies Institute is tackling one of the nine United Nations' Global Goals – 'Good Health and Well-Being'. Researchers are finding new ways to combat antibiotic resistance – one of the biggest challenges facing mankind.

## The evidence

- The University of Birmingham's expert doctors, scientists, engineers, mathematicians and physicists are working collaboratively to speed up the translation of new discoveries into health applications.
- The University of Birmingham has the second largest medical school in the country and provides significant numbers of high calibre graduates in medical, biochemistry and related fields to meet the future needs of the sector.
- The area around Birmingham's campus has the highest density of medical and life sciences activity in the UK, with over 500 medical technology companies based here – more than in any other UK region.
- The Healthcare Technologies Institute is located in the Institute for Translational Medicine (ITM), a facility on the site of the Queen Elizabeth Hospital that acts as a central hub for clinical trials acceleration and stratification, and clinical informatics. Our facilities are shared with collaborator, MD-TEC, and includes purpose-built replicas of key clinical areas, including an operating theatre.
- The University of Birmingham is a member of Birmingham Health Partners (BHP), a strategic alliance between the University and three major teaching hospitals; the Shelford Group member University Hospitals Birmingham NHS Foundation Trust (UHB); and Birmingham Women and Children's NHS Foundation Trust (BWC). BHP's mission is to harness research strengths in the University and the NHS to deliver better treatments and care for patients.
- The Medical Devices Testing and Evaluation Centre (MD-TEC) is supported through the European Regional Development Fund, which will boost the life science economy in the Greater Birmingham area. It will enhance the growing regional reputation for medical device development, including collaboration with the NHS and academia, as well as the commercialisation of devices.

- The Birmingham Life Sciences Park (BLSP), which will begin phased construction in 2020, will harness world-leading academic and clinical strengths while bringing new commercial power to the region to accelerate life sciences research, taking innovative new healthcare treatments and technologies from early development to real life application. The site, located in Selly Oak, will utilise the unrivalled healthcare infrastructure of Birmingham Health Partners (University of Birmingham and University Hospitals Birmingham NHS Foundation Trust), the Institute of Translational Medicine (ITM) and the BioHub Birmingham, among other centres of research and practise excellence.



## Key projects

### Early detection

Early detection of prostate cancer is critical. It is one of the most common types of cancer in men and claims over 10,000 lives in the UK every year. Researchers at the Healthcare Technologies Institute have developed a new test that helps detect prostate cancer more efficiently. Using a synthetic detection platform on a gold sensor chip, the new test is designed to precisely distinguish between the different types of sugars attached to proteins in order to detect prostate cancer earlier and more effectively through a simple blood test. The technology will be available to support laboratories within three to four years, with the final goal being a point-of-care device available in surgeries, significantly reducing the lead time to detection and improving the patients' chances of survival.

### Tackling antibiotic resistance

Scientists and engineers at the Healthcare Technologies Institute are helping to increase life expectancy by finding new ways to combat antibiotic resistance to fight infections globally. A collaboration between the University of Birmingham and British bio-tech company Matoke Holdings Ltd, inventors of Reactive

Oxygen® are investigating a number of different formulations to deliver the active compound, including sprays. Reactive Oxygen® is a novel solution for controlling bacteria growth, both preventing and treating infection, that has already reached early clinical use. It has major potential in the fight against drug-resistant infections.

### Healing without scarring

65% of trauma victims suffer from problematic scarring, some of which can remain for the rest of their lives. Researchers at the University of Birmingham and the National Institute for Health Research Surgical Reconstruction and Microbiology Research Centre (NIHR SRMRC) have created a biomembrane dressing using the molecule Decorin, which will prevent scarring in injured tissue. The dressing is being tested on burns patients at Queen Elizabeth Hospital Birmingham (QEHB) in a three-year clinical trial after the team were awarded a £1.6 million grant from the Wellcome Trust to fund the research. There is currently no treatment for problem scars, so this research will be a huge benefit to patients.

