

**BARTS LIFE SCIENCES**

DISCOVERY / DIVERSITY / DELIVERY

# TRANSFORMING HEALTHCARE FOR LONDON, THE UK AND THE WORLD





# WE ARE BARTS LIFE SCIENCES

**The need for pioneering, effective and affordable innovations in healthcare has never been greater. People in the UK, and the world, are living longer but not necessarily healthier lives.**

**Now, Barts Health NHS Trust and Queen Mary University of London, supported by Barts Charity, have come together in a powerful partnership to help accelerate the latest healthcare innovations from bench to bedside.**

**Our partnership is called Barts Life Sciences.**

Together, as Barts Life Sciences, we have all the core components required to transform patient care for those living locally, nationally and internationally.

As a partnership between a world-renowned research university and one of the largest hospital groups in the country, located in one of the best connected cities in the world we have something special to offer. We have the scientific skills needed to **discover** new innovations and the practical experience of modern day healthcare to know how they should be **delivered**. We are also based within one of the most **diverse** communities anywhere in Europe. This diversity, coupled with the multitude of organisations we work with, creates a unique offer to the world.

We have a vision to create a new life sciences hub, located in the historic Whitechapel area of London, that will discover the next generation of health innovations and deliver them to the UK and beyond.

We would like to invite you to be part of this exciting vision and help us transform healthcare.

“Barts Life Sciences is uniquely placed to drive the future of healthcare innovation. Drawing on our expertise in discovery and delivery at the heart of our richly diverse community, Barts Life Sciences offers an exciting vision for life sciences and medical breakthroughs.”



**Professor Rakesh Uppal**  
Director of Life Sciences and Consultant Cardiac Surgeon  
Barts Health NHS Trust & Queen Mary University of London



# FOREWORD

For centuries, our two organisations have discovered and delivered cutting-edge and transformative health solutions for people around the world. Now, as Barts Life Sciences we have a once in a lifetime opportunity to revolutionise healthcare and deliver better outcomes for everyone.

Our vision, made possible through this transformative partnership, is to create a life sciences hub in Whitechapel that will:

- **Accelerate** research and development through the innovation chain from the bench to the bedside
- **Transform** health and wellbeing inequalities and patient care
- **Create** a sustainable NHS that is recognised as a world-leader in prevention, prediction and precision healthcare

We are excited to be working together to deliver this vision; combining the discovery expertise from Queen Mary University of London with the experience of delivering high-quality care at Barts Health NHS Trust. Together, we will work with ground-breaking life sciences organisations and pioneers from the UK and beyond.

Our ambitions for this hub fully align with the UK Life Sciences Industrial Strategy. It will utilise data to drive innovation and deliver personalised treatments, position the UK at the forefront of life sciences innovation and create the infrastructure to promote growth. By taking advantage of the opportunity we have in Whitechapel, the UK can build on its role as a global leader in life sciences.

From our cutting edge facilities to our world-leading researchers and clinicians, from our diverse

community to our exceptional location – we have everything we need to create a unique life sciences hub in East London. Join us as we realise this vision.



**Alwen Williams,**  
Group Chief Executive Officer  
Barts Health NHS Trust



**Colin Bailey,**  
President and Principal  
Queen Mary University of London

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# WHAT MAKES US SPECIAL

**We will transform the future of healthcare, not only for the people of London and the UK, but globally.**

While transformational work is already underway, our ambition is to build a new life sciences campus that will provide a space for our researchers, scientists and clinicians to work directly alongside businesses and entrepreneurs, creating the healthcare solutions of tomorrow. This will allow us to share ground-breaking ideas, develop new ways of working, improve health outcomes and reduce the costs faced by health systems.

The establishment of a new life sciences hub in Whitechapel will create thousands of high-quality jobs and lead to billions of pounds of investment in the East London economy. As well as creating jobs, Barts Life Sciences plans to make significant training and development opportunities available to local people.

We are seeking partners to take advantage of all of this and so much more:



## Our impressive track record

We have a rich history of turning discovery science into the delivery of transformative care. For example, we have made improvements in the treatment of chronic Hepatitis C and made instrumental developments in the field of antenatal screening. Through our partnership we are able to bring together some of the best minds in the country, across multiple disciplines, to enable knowledge sharing and facilitate exciting collaborations that drive scientific advancements forward.



## Unparalleled data

We have one of the largest patient populations of any healthcare organisation in the country and access to rich and extensive data sets. Barts Life Sciences itself is home to three national biobanks and hosts 21 separate research repositories containing over 500,000 human tissue samples. This data, used responsibly and with consent, has the potential to be a rich resource for the discovery and delivery of new technologies like predictive AI-enabled healthcare tools.



## Unrivalled diversity

Whitechapel is home to one of the most diverse populations in Europe. We also have over 34,000 patients actively involved in research programmes. By working in partnership with the local community, our ambition is to discover and deliver better health outcomes for people on a global scale, and bring new treatment to patients faster.



## Powerful partnerships

An exciting partnership already exists within Barts Life Sciences, in which organisations have come together to deliver innovative projects with organisations from across the country. For example, in 2017/18 we undertook 150 industry sponsored trials and we are currently collaborating with a number of organisations to deliver leading genomics programmes. However, there is great potential for more collaboration in this area to deliver innovative and transformative healthcare solutions.



## The perfect location

Whitechapel represents one of the most exciting new locations for a life sciences hub; strategically placed between Europe's financial hub and London's thriving start-up community. We already benefit from world-class transport links, which are due to be improved even further with the introduction of Crossrail.

"This will truly be a cross-disciplinary approach, making the most of access to Queen Mary facilities and our research expertise. We will work in close partnership with Barts Health across the medical sciences, engineering, social sciences and humanities, to take discoveries all the way from the lab bench or desk to clinical delivery."



**Professor Steve Thornton**  
Vice Principal (Health)  
Queen Mary University of London



## A once in a lifetime opportunity

We are excited about the potential of the new life sciences hub and we now have a unique opportunity here in Whitechapel to bring together researchers, scientists, entrepreneurs and clinicians to look at new solutions to challenge outcomes and reduce health inequalities.





Whitechapel is one of the most exciting places to discover the future of healthcare, and deliver it to the world.

# FROM WHITECHAPEL TO THE WORLD



Blizard Institute, the largest institute of Barts and The London School of Medicine and Dentistry

Barts Life Sciences comprises an NHS Trust that accounts for 1.5% of all hospital activity in the UK and a Russell Group University that is ranked third in the world for medical research citations. All of this is supported by Barts Charity, which works alongside the Barts Life Sciences to help deliver world-leading research, state-of-the-art equipment and innovative healthcare projects. For almost 1,000 years, we have been pioneering innovations from bench to bedside that have transformed the lives of patients around the globe.

Our collaboration is unrivalled in the sheer scale of healthcare delivery, and for centuries, our researchers and scientists have collaborated to deliver. Recent highlights include:

#### Cutting-edge research

Funded by Barts Charity, academics and clinicians have come together to undertake translational research into a cure for brain tumours which could transform patient's lives around the world

#### Ground-breaking trials

In December 2017, a cure for haemophilia came closer with the discovery of a revolutionary new gene therapy drug

#### Life-saving results

Research into Acute Traumatic Coagulopathy, a syndrome of abnormal clotting after trauma, has led to a new understanding about why patients bled to death after severe injury, and a 250-300% improved in survival rates

#### World-first operations

St Bartholomew's Hospital was the first hospital in the UK to carry out a pioneering procedure to repair leaking heart valves without the need for invasive surgery

## Delivering translational medicine

To ensure we are able to discover and deliver these medical breakthroughs of the future, we have access to cutting-edge laboratories and facilities to support our research, including DNA sequencing and analysis. Some of the most notable facilities, hosted by Queen Mary University of London, include:

- the Bio-Innovation Centre which hosts drug discovery start-ups and supports over 400 jobs
- the William Harvey Research Institute, which is one of the largest pharmacological research institutes in Europe
- our Centre for Experimental Cancer Medicine, which has up to 120 trials open at any one time
- the Wolfson Institute of Preventative Medicine, which translates research into public health strategies to help the reduction of disease and disability.

We recognise the value of inter-disciplinary research from medicine and basic sciences, through to engineering, social sciences and humanities in facilitating innovation. This approach is at the heart of Barts Life Sciences and we believe it will drive innovative research in precision medicine and improve patient care. We plan to co-locate research staff directly alongside clinicians and life scientists within our campus, using proximity to help create the environment required to translate research into results and new treatments.

Together with this expertise and state-of-the-art facilities, we work in close collaboration with the local community and have access to large, diverse and high quality data sets that are integral to helping us drive the discovery of health innovations. Today, a multitude of clinical trials are creating a wealth of data and insights in areas such as cardiovascular and respiratory.





# RESEARCH THAT DELIVERS

**Barts Life Sciences will deliver on three healthcare priorities – prevention, prediction and precision. By better predicting what conditions a patient might develop or how a disease might evolve, we can treat it more effectively. Through earlier and improved medical intervention, we can prevent people from becoming unwell in the first place and by developing personalised, targeted medicines, we can dramatically improve patient outcomes. This is the future of healthcare and we plan to be at the very heart of it.**

**To deliver on these priorities, we have four core areas of focus for translational research, through which we are already delivering world-leading results. Within these areas, we bring together exceptional interdisciplinary teams, in state-of-the-art facilities to continue to deliver cutting-edge health solutions.**



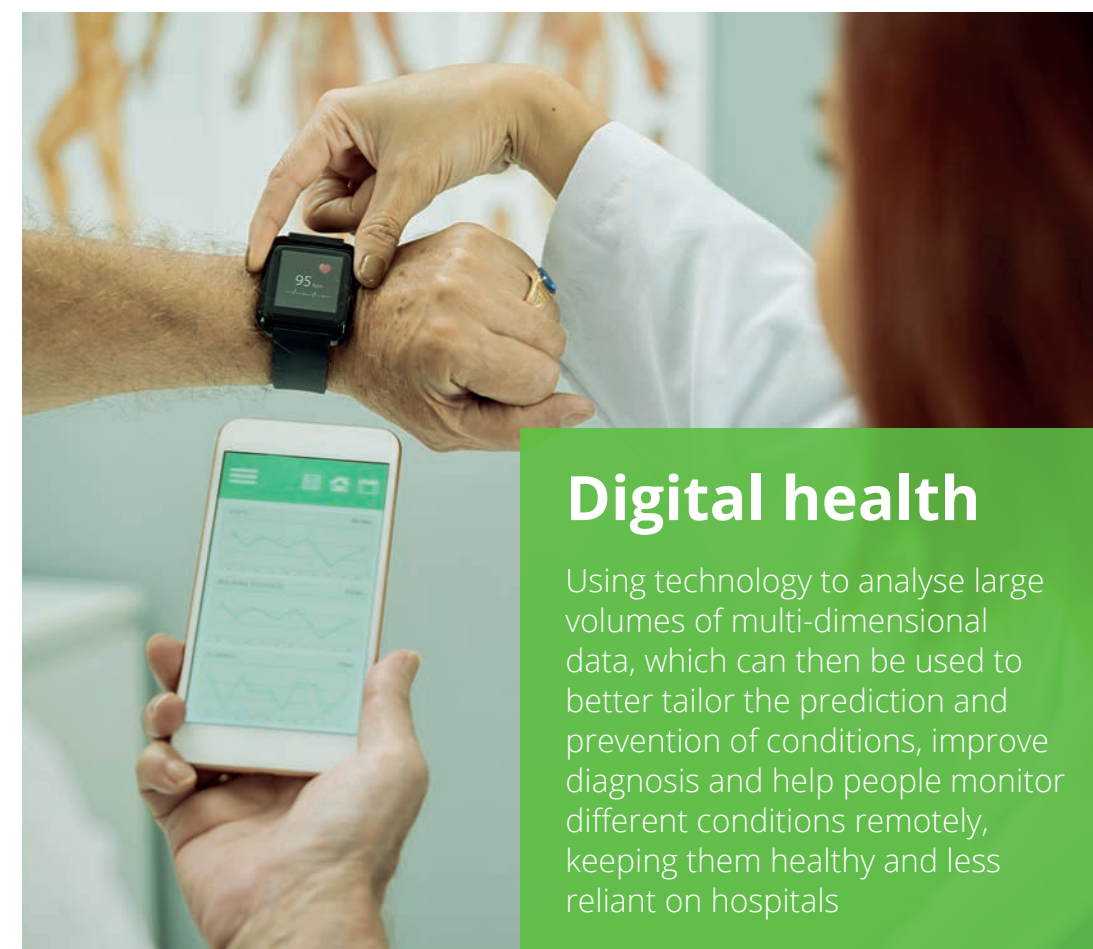
## Precision-omics

Studying why different people get sick in different ways, so we can produce more personalised medicine tailored to individuals



## Population health

Studying the social, environmental and behavioural issues that may impact how different conditions develop for different people, and finding better ways to prevent and treat them



## Digital health

Using technology to analyse large volumes of multi-dimensional data, which can then be used to better tailor the prediction and prevention of conditions, improve diagnosis and help people monitor different conditions remotely, keeping them healthy and less reliant on hospitals



## Advanced medical technologies

Developing new materials to use in operations that will aid recovery and comfort



# UNPARALLELED DELIVERY

We have the resources, datasets and the expertise required to enable your business to grow and deliver transformative healthcare. We have an exceptional track record in working with industry to deliver clinical trials as well as in supporting start-ups to scale and grow successfully.

Barts Life Sciences hosts the largest number of commercial clinical trials in the country

with over **34,000**

patients actively involved in research programmes



**180,000**

young people inspired

Our informal science learning project, Centre of the Cell hosted by Queen Mary University of London, reaches over 20,000 school-age children each year



Barts Health is home to **three** national biobanks and hosts **21** separate research repositories containing over

**500,000** human tissue samples



**16K**

patients involved in clinical research across **429** studies

meaning Barts is in the top ten highest recruiting trusts for all kinds of research across the NHS



In 2016 Queen Mary became the first university to be awarded a **Gold Engage Watermark** from the National Coordinating Centre for Public Engagement (NCCPE), recognising us as a beacon of excellence in the support we offer to public engagement



Queen Mary has a strong track-record in research spin-outs and student start-ups, e.g. Apatech spin-out, which was sold for

**\$330m**

Queen Mary is ranked **third in the world** for research citations in the QS World University Rankings 2019



# DEVELOPMENT WHERE IT'S NEEDED

The combined expertise within Barts Life Sciences will help to address the health needs of the local population; reducing health inequalities and improving outcomes.

Around **2.5m** people speaking more than 60 languages



**3rd** out of **326** boroughs for deprivation

Whitechapel is located in Tower Hamlets, ranked third of 326 local authorities in England for multiple deprivation measures (2015 English Indices of Deprivation), while the neighbouring boroughs of Newham and Hackney are also ranked in the top 10 for a range of measures of deprivation

**Life expectancy**

for men in Tower Hamlets is **5 years** less than in Kensington and Chelsea, just seven miles away



Tower Hamlets has amongst the

**highest premature death rates**

from the major killers: **cancer, cardiovascular disease, and chronic lung disease**





# TODAY'S TECHNOLOGY, TOMORROW'S MEDICINES

**By using AI technology and precision medicine, our heart centre is saving more than 500 lives each year.**

Cutting-edge technology will power our four core research pillars – digital health, precision-omics, advanced technologies and population health. We are already using technology to develop new AI driven, non-invasive, methods to assess social engagement and mine data from online health message boards to develop answers to key questions that a clinical trial developer will ask, such as what is the optimal location to conduct a trial.

Technologies like AI play a vital role in allowing us to predict which medical conditions might affect people, how the condition might evolve over time and what treatments may prove most effective. However, AI is only as powerful as the data used to drive its development.

We have the rich and diverse datasets that will unleash the full potential of AI in healthcare. We have already collated vast amounts of data – which has been appropriately anonymised – from across primary, secondary and mental health sectors in East London as part of the London Local Integrated Care Record Exemplar (LICRE). This initiative is helping us to embed digital change and act as an enabler for service transformation on the ground by making clinical

information instantly available to teams delivering care to the population, allowing them to make more informed decisions. In addition, the ground-breaking Discovery East London programme – which brings together all seven East London CCGs – has led to considerable improvements in routine population health clinical outcomes through the adoption of a Learning Health System. By combining real-time data reporting from across primary, community, acute and mental health organisations in East London, the programme has, for example, enabled GPs to intervene much earlier in introducing stroke prevention measures.

We have extensive experience in robotics and bio-engineering, with exciting new advancements including the creation of surgical robots that are capable of adapting to their environments better than their traditional rigid-body counterparts. Our expertise in technology has also led us to play a key role in raising the UK's reputation in this field. We played a central role in London's selection as the host city for world-leading robotics and AI conference, 'International Conference on Robotics and Automations (IRCA)' taking place in 2023.

## CAP-AI

CAP-AI is a pioneering research programme in AI taking place at Barts Life Sciences, and which is supported by Barts Charity. It aims to place healthcare in East London at the forefront of the AI and technology revolution, and will provide SMEs with access to clinicians, academics and high-quality data from London's largest NHS Trust, as well as high-performing computational power and technical expertise and talent. Comprised of five projects, CAP-AI is London's first AI-enabling programme focused on stimulating growth in the capital's AI cluster, using AI and machine learning to deliver innovative healthcare and services to improve outcomes for patients. The five projects that are currently underway are looking into a variety of areas, including the use of AI to advance cardiac MRI analysis, and to predict vascular complications in diabetes, with results expected in late 2020.



### AI for advanced cardiac MRI analysis for better patient care

"Contrast administration is a key component of diagnosing heart diseases and evaluating cardiac risk using cardio-vascular magnetic resonance (CMR). Using machine learning techniques, we are carrying out comprehensive analyses of non-contrast and contrast images in order to develop AI powered models. We anticipate that CMR images can predict contrast CMR information accurately and eliminate the need to administer contrast to many patients. This will improve safety, save patient and clinical time, and significantly reduce costs."

**Steffen Petersen**  
Professor of Cardiovascular Medicine, Queen Mary University of London  
Director for Research Barts Heart Centre and Principal and Chief Investigator of the Barts BioResource





# UNMATCHED DATA, UNRIVALLED DIVERSITY

What makes our collaboration unique is the scale and diversity of our local population and the close relationship between the Trust, the University and the London Borough of Tower Hamlets. We have hundreds of thousands of local residents, speaking more than 60 languages. This diversity enriches and enhances our ability to discover solutions that can work in London and the world.

Currently there are over 32,000 patients from the local community actively involved in clinical research programmes, and in terms of scale, Barts Life Sciences is home to some of the largest clinical trials in the UK. The insights from these unique data sets can – and already are – being used to help drive the creation of new solutions which will aid the reduction of health inequalities locally, nationally and around the world. We are investing in this activity even further. In July 2019, we opened a new clinical research centre at The Royal London Hospital – funded by Barts Charity – so even more people can participate in research and help push the frontiers of medical science.

"The sequencing of 100,000 whole genomes marks an extraordinary UK achievement that is transforming the application of genomics in our NHS."

**Professor Sir Mark Caulfield**  
Queen Mary University of London and  
Chief Scientist at Genomics England

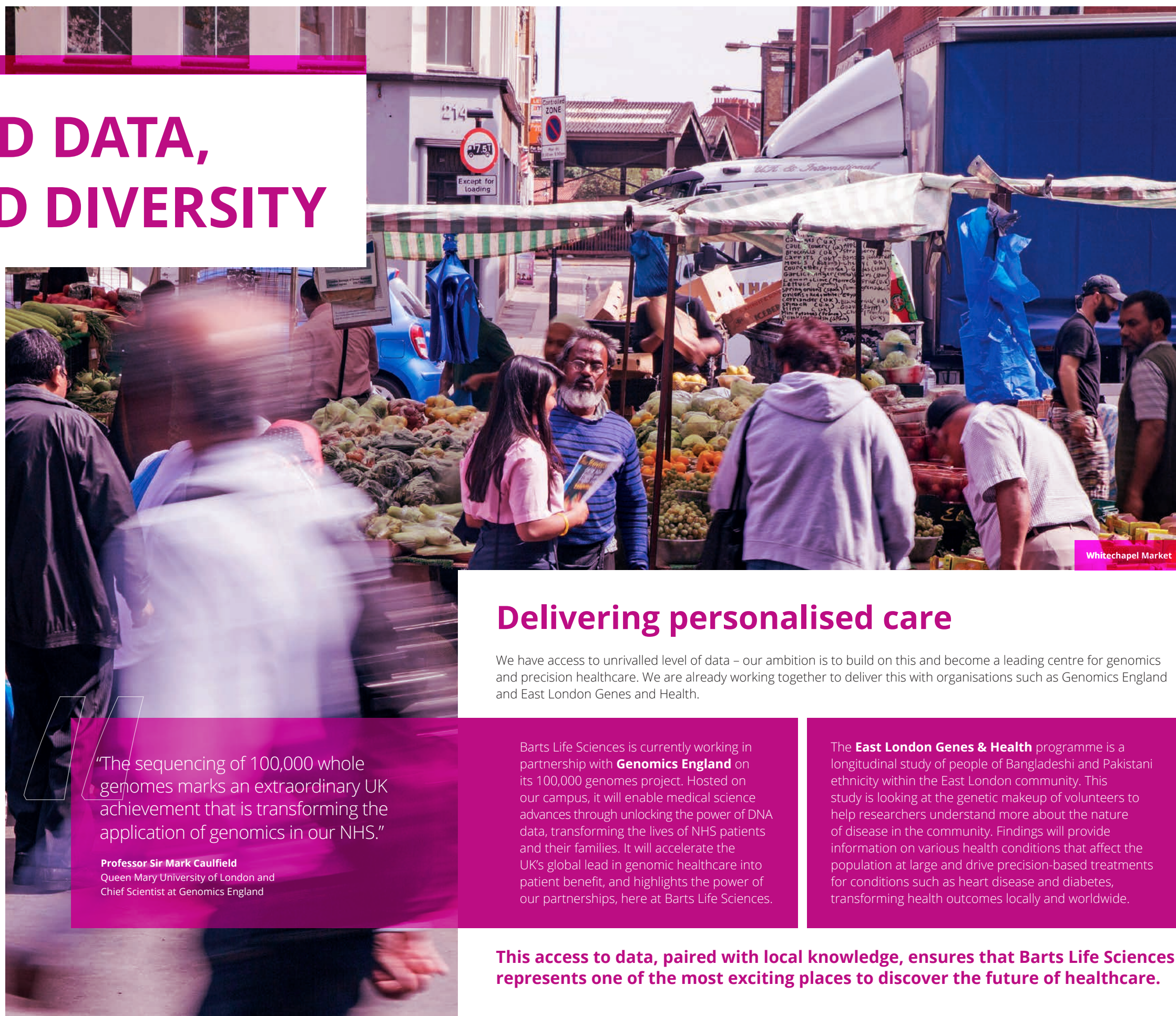
## Delivering personalised care

We have access to unrivalled level of data – our ambition is to build on this and become a leading centre for genomics and precision healthcare. We are already working together to deliver this with organisations such as Genomics England and East London Genes and Health.

Barts Life Sciences is currently working in partnership with **Genomics England** on its 100,000 genomes project. Hosted on our campus, it will enable medical science advances through unlocking the power of DNA data, transforming the lives of NHS patients and their families. It will accelerate the UK's global lead in genomic healthcare into patient benefit, and highlights the power of our partnerships, here at Barts Life Sciences.

The **East London Genes & Health** programme is a longitudinal study of people of Bangladeshi and Pakistani ethnicity within the East London community. This study is looking at the genetic makeup of volunteers to help researchers understand more about the nature of disease in the community. Findings will provide information on various health conditions that affect the population at large and drive precision-based treatments for conditions such as heart disease and diabetes, transforming health outcomes locally and worldwide.

**This access to data, paired with local knowledge, ensures that Barts Life Sciences represents one of the most exciting places to discover the future of healthcare.**



Whitechapel Market





# MULTIPLE TEAMS, ONE FOCUS – TRANSFORM HEALTHCARE

From renowned academics to frontline clinicians, we are comprised of diverse organisations that are working together to advance the healthcare of the future. However, we also want to facilitate exciting collaborations with the best partners, life sciences organisations, entrepreneurs and start-ups around the world, to drive and deliver scientific advancements.

At Barts Life Sciences we already have well established partnerships with local, national and international organisations, such as UCL Partners, Greater London Authority, Capital Enterprise, MedCity, the Alan Turing Institute and NESTA, which are being harnessed to help advance innovations within life sciences.

There are also many existing collaborations with industry at Barts Life Sciences, for example with Novartis and Medtronic. However, there is great potential for future industry collaborations too. Businesses joining us can take advantage of everything on our expanding life sciences campus, from our labs and incubation space to our expert clinicians and world-renowned researchers, to deliver innovative and transformative healthcare solutions.

We are always looking for opportunities to collaborate to tackle the health challenges of tomorrow. For example:

- We are currently working with three other London based universities on the Health Data Research UK (HDR UK) which will enable us to build on our strengths in e-health data research and human genomics, to help improve the long term health of our local communities, especially diabetes and cardiovascular disease
- We are also hosting one of the 15 new National Institute for Health Research (NIHR) Applied Research Collaborations, which will join-up some of the country's best universities, leading innovators and local authorities to solve some of the biggest issues facing health and social care over the next five years

**If you are looking to solve the biggest medical problems and revolutionise patient outcomes, join us.**



## Space to innovate

More than **2.5 million sq ft** of land is already being used for exciting life sciences activity in Whitechapel, and we are currently investing to expand this space even further, creating a University Enterprise Zone to enable drug discovery start-ups and businesses to continue to drive innovation. There is also an opportunity to expand into a **further 1 million sq ft** of potential land in the area to create much-needed space for life sciences companies to grow and scale within the capital. We are actively looking for partners to build their visions and develop their innovations from our home.





# THE PERFECT LOCATION

Whitechapel represents one of the most exciting new locations for a life sciences hub.

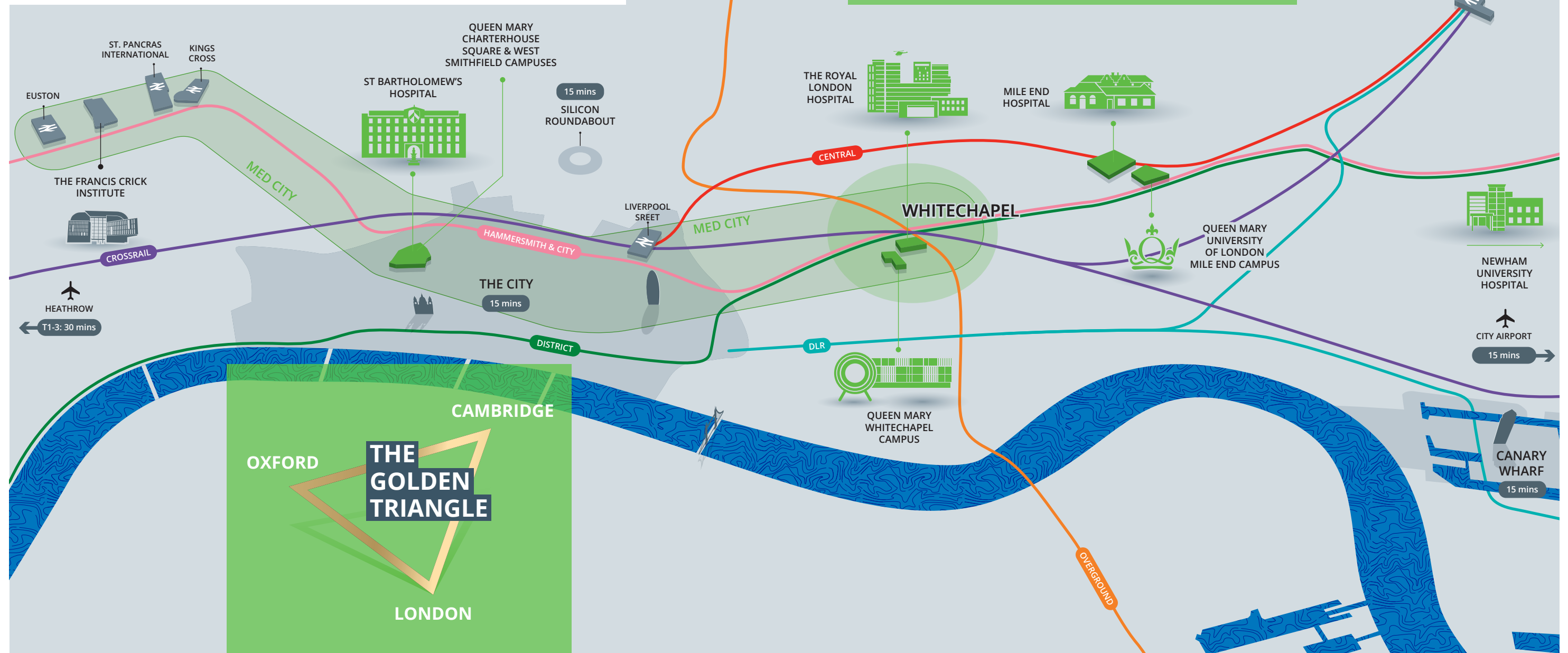
Barts Life Sciences is strategically placed between Europe's financial hub, MedCity – a collaboration that aims to promote and grow the world-leading life sciences cluster of England's Greater South East – and London's thriving start-up community. We already benefit from this proximity through our existing partnerships, such as our CAP-AI programme which is led by Capital Enterprise – 'London's start-up experts' – located just off Silicon Roundabout.

In addition, we are able to take advantage of the world-class transport links and can reach the City and Canary Wharf in around 15 minutes and an international airport within 20 minutes. Whitechapel is also currently going through a major regeneration project which will improve connections even further with the arrival of Crossrail, as well as new affordable housing developments, retail expansion and increased employment opportunities.

## ...AT THE HEART OF LIFE SCIENCES

Barts Life Sciences' location is well situated in the UK's capital. London supports an exceptionally rich source of life sciences innovation and intellectual property, due to the presence of its world class universities, major research institutes and innovative tech start-up ecosystem. The capital also sits as a key part of the Golden Triangle, one of the world's leading concentrations of life sciences expertise and innovation.

In London, the life sciences industry contributes £9.6bn to the economy as well as 24,000 jobs. The city has an outstanding base for the delivery of an exceptional life sciences ecosystem, with an excellent research base in world-renowned universities and significant capabilities in clinical and transitional medicine in the NHS.





# PIONEERS, VISIONARIES AND DISRUPTORS WANTED

We truly believe this is an incredibly exciting vision for East London – and the world – and we hope you feel the same.

Over the coming years, we will make a measurable difference to the local population, not only fighting and reducing health inequalities, but also by providing investment into the local economy and creating jobs as well as training opportunities.

We have a vast amount of rich data, which we will use to transform health outcomes around the globe, ensuring we can discover new innovations and deliver preventative and personalised care, relieving some of the immense pressure facing health systems.

Whether it's through supporting the delivery of end-to-end clinical trials within a globally representative population; developing a research and development partnership; working with our world-leading researchers and clinical staff; or making use of our state-of-the-art facilities, there are vast opportunities to join our vision and help transform the future of healthcare.

**We can't wait to work with you.**

"I am delighted that Bart's has partnered with Queen Mary University of London and chosen Whitechapel for its new life sciences campus. London is a world-leading hub for life sciences, and this is a huge boost for this important sector – demonstrating again that London is open for world-class science and innovation, as it has been for hundreds of years."

**Rajesh Agrawal**  
Deputy Mayor of London for Business



**Professor Rakesh Uppal**, Director of Barts Life Sciences, Consultant Cardiac Surgeon  
[rakesh.uppal@bartslifesciences.org](mailto:rakesh.uppal@bartslifesciences.org)

## If you're a company or start-up:

Ask us about the space available at our Whitechapel home to build and grow your vision taking advantage of the access to our world-renowned clinicians and academics, rich diversity and data, as well as our excellent connectivity.



**Professor Rupert Pearse**, Clinical Director of Research & Development, Joint Research Management Office, Barts Health & Queen Mary  
[rupert.pearse@bartslifesciences.org](mailto:rupert.pearse@bartslifesciences.org)

## If you're a research organisation or charity:

Contact us about the research and collaboration opportunities available with us.



**Kimberley Freeman**, Executive Officer for Public Engagement and Director of the Centre for Public Engagement, Queen Mary  
[kimberley.freeman@bartslifesciences.org](mailto:kimberley.freeman@bartslifesciences.org)

## If you live in the local area:

Reach out to us to find out more about the difference we plan to make to Whitechapel and how you can be involved.



**Sven Bunn**, Barts Life Sciences Programme Director  
[sven.bunn@bartslifesciences.org](mailto:sven.bunn@bartslifesciences.org)

## If you would like to work with us:

Get in touch if you would like to find out more about opportunities to work within Barts Life Sciences campus.



**Gretchen Ladish**, Barts Life Sciences Programme Management  
[gretchen.ladish@bartslifesciences.org](mailto:gretchen.ladish@bartslifesciences.org)

## If you're just interested to find out more:

Visit our website [bartslifesciences.org](http://bartslifesciences.org) to watch our film and learn more about this exciting project.



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DISCOVERY / DIVERSITY / DELIVERY

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