UNIVERSITY OF CAMBRIDGE
Victor Phillip Dahdaleh
Heart & Lung Research Institute

Improving heart and lung health for everyone

Foreword

"There is an urgent need to find new ways to prevent, diagnose and treat cardiovascular and respiratory disease, and this is the core purpose of our Institute. We aim to improve health outcomes for populations and people around the world.

Uniquely, we bring population health, laboratory and clinical researchers together with NHS clinicians, patients and their loved ones. We work together under one roof alongside our commercial and charitable partners.

Since we opened our doors in 2022 our research has already improved the lives of patients, but there are still many pressing health challenges to address."

Professor Charlotte Summers, Director

Professor Charlotte Summers

The impact of heart and lung disease

The numbers

Despite a growing awareness of risk factors, the prevalence of cardiovascular and lung disease is increasing.

27M

27 million deaths globally are caused by cardiovascular and lung diseases each year

1 in 4

1 in 4 deaths are caused by cardiovascular disease in the UK

1 in 5

1 in 5 deaths are caused by respiratory disease in the UK

Reducing the consequences

The HEAL-COVID trial has changed the way we care for people who were admitted to hospital with Covid-19, and is led by Chief Investigators based at the Institute.

“

The HEAL-COVID trial was the first time I took part in research that directly affected me, and I would do the same again in the future to help others.

Mercy Njoku, HEAL-COVID trial participant, recruited from South London

Visit heal-covid.net/about/ to read about the scale of the trial

Finding new treatments for Pulmonary Arterial Hypertension

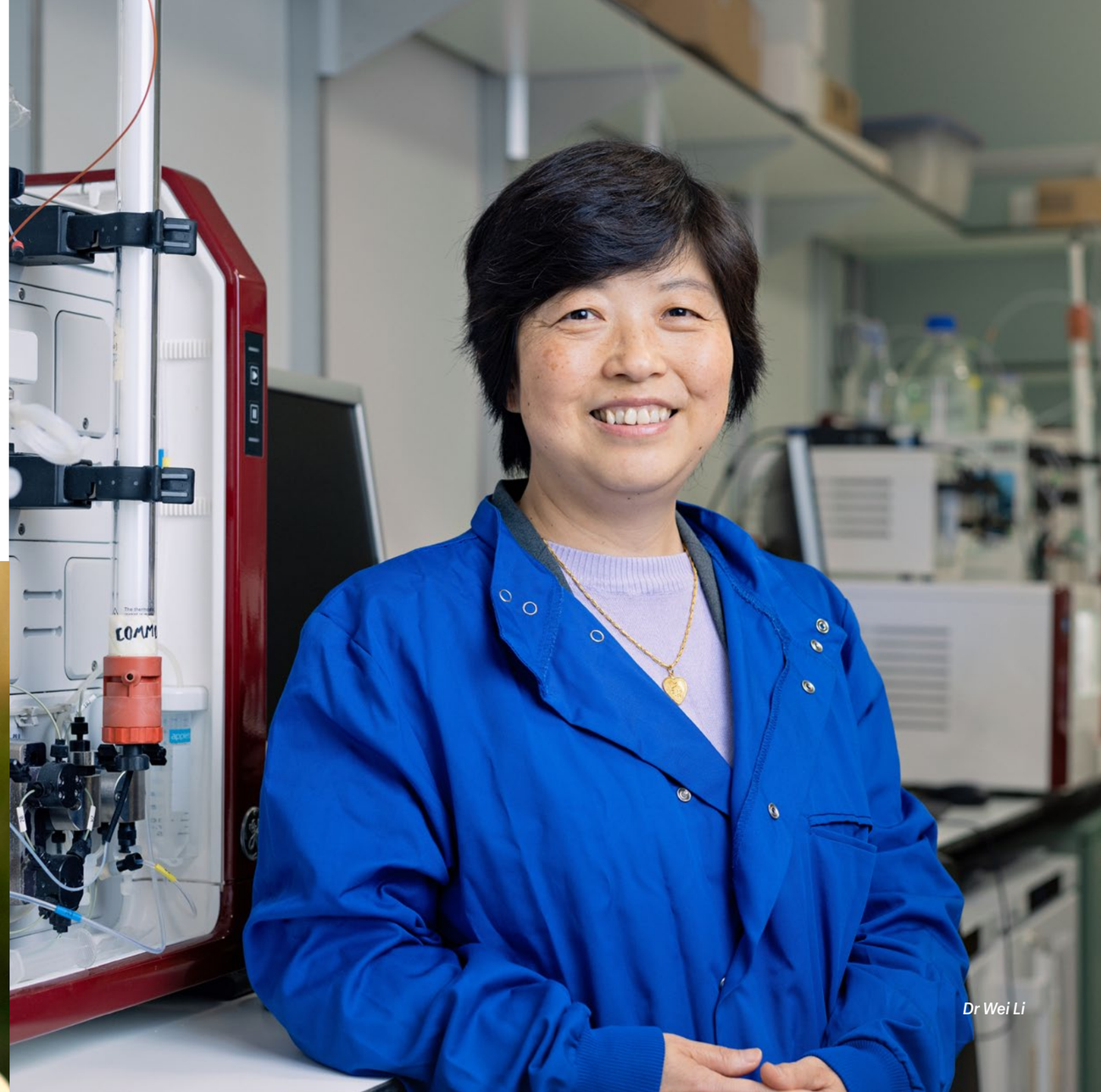
"I study a rare genetic disease called Pulmonary Arterial Hypertension. It affects 40–50 people per million in the UK. There is no cure and few treatment options.

My research group is studying the signalling pathways that contribute to Pulmonary Arterial Hypertension, particularly the role of a protein called Bone Morphogenic Protein.

We are trying to create a new treatment by exploring innovative ways to target the pathway.

I co-founded a spin-out company called Morphogen-IX with Professor Nick Morell and Dr Paul Upton to help us do this. We created a mutant protein that seems to have a therapeutic effect in animal models without the common side-effect of bone formation.

The mix of disciplines within the Institute is important for scientific discovery, and has led us into new research areas and to adopt powerful new techniques."



Dr Wei Li

How we are helping

The Victor Phillip Dahdaleh Heart & Lung Research Institute

450
Members of staff

¾
From academia

¼
From NHS

“

The Institute’s ability to bring Cambridge researchers together with the NHS, with patients and with biomedical industry partners, gives it the best chance of making advances that will have a transformative impact on patients’ lives.

Professor Deborah Prentice,
Vice-Chancellor of the University of Cambridge

Research

⅓
Clinical

⅓
Laboratory science

⅓
Population health

Current research funding

Over £200 million

as of Summer 2024

203

Research publications in 2023

Improving access to COPD treatment

"We are trying to make access to one of the best treatments for Chronic Obstructive Pulmonary Disease (COPD) more equitable, by better understanding the barriers to taking up treatment.

COPD often has a profound impact on people's lives, reducing their ability to work, socialise and do things most of us take for granted.

In our UPTURN study we are working with Bangladeshi and Black African & Caribbean communities to help find new way to help people understand the role of Pulmonary Rehabilitation.

Pulmonary Rehabilitation leads to fewer admissions to hospital and a better quality of life for 90% of patients.

The VPD-HLRI is ideal to foster this sort of multi-discipline and collaborative research project, enabling linkages between researchers with very different perspectives on how to improve health outcomes."

90%

of patients have a better quality of life after Pulmonary Rehabilitation treatment

Dr Jonathan Fuld

Angela Balistrieri,
a second-year PhD student

A culture where research thrives

“

Having the Institute on our doorstep is beneficial for our patients and our clinicians. This collaborative approach is essential to improve health.

Eilish Midlane, CEO, Royal Papworth Hospital NHS Foundation Trust

The Institute provides a unique environment to bring researchers with different backgrounds together to improve cardiovascular and lung health.

Researchers benefit from being a stone’s throw from three hospital trusts, as well as the University’s Schools of Clinical Medicine and Biological Sciences. Nearby are pharmaceutical companies ranging from start-ups to industry giants AstraZeneca and GSK.

Our building is designed to welcome scientists, clinicians and the public. The ground floor hosts community events and houses an NIHR-accredited Clinical Research Facility to support early-phase clinical trials. Upstairs, an expansive open-plan office area connects state-of-the-art wet and dry laboratories.

Angela Balistrieri, a second-year PhD student, says she feels lucky to work in the Institute: “The building is really cool because it is very open, so it is very easy to talk to other people who are working in nearby labs. Everyone is super helpful and happy to share their knowledge.”

A new approach to prevent disease

“I am trying to find a new way to prevent diseases in people at the earliest opportunity.

Chronic diseases, such as diabetes, cancer, heart disease, dementia and kidney disease, are on the rise in the UK and cause people to live in poor health for many years and die prematurely.

The approach to disease prevention has been siloed in the past, looking at strategies to prevent single diseases separately.

We are taking a more holistic, person-centred approach to develop a tool to help people understand their personal risk of future disease. Clinicians will be able to use the tool to have better conversations with people during NHS health checks, which we hope will empower patients to reduce their risk of multiple diseases.

The VPD-HLRI is a good place to look at multi-disease prevention. Being in the building means I bump into clinicians and discuss my work, and this has been crucial to the project.”

Professor Angela Wood

Improving global heart health

"Rates of serious cardio-metabolic diseases, such as heart disease, kidney disease and diabetes, are particularly high in South Asia and Bangladesh.

We have recruited 75,000 people to a large cohort study called BELIEVE to understand why these diseases are so prevalent and what we can do to prevent them. It is the largest study of its kind in Bangladesh, and only one of a few in South Asia.

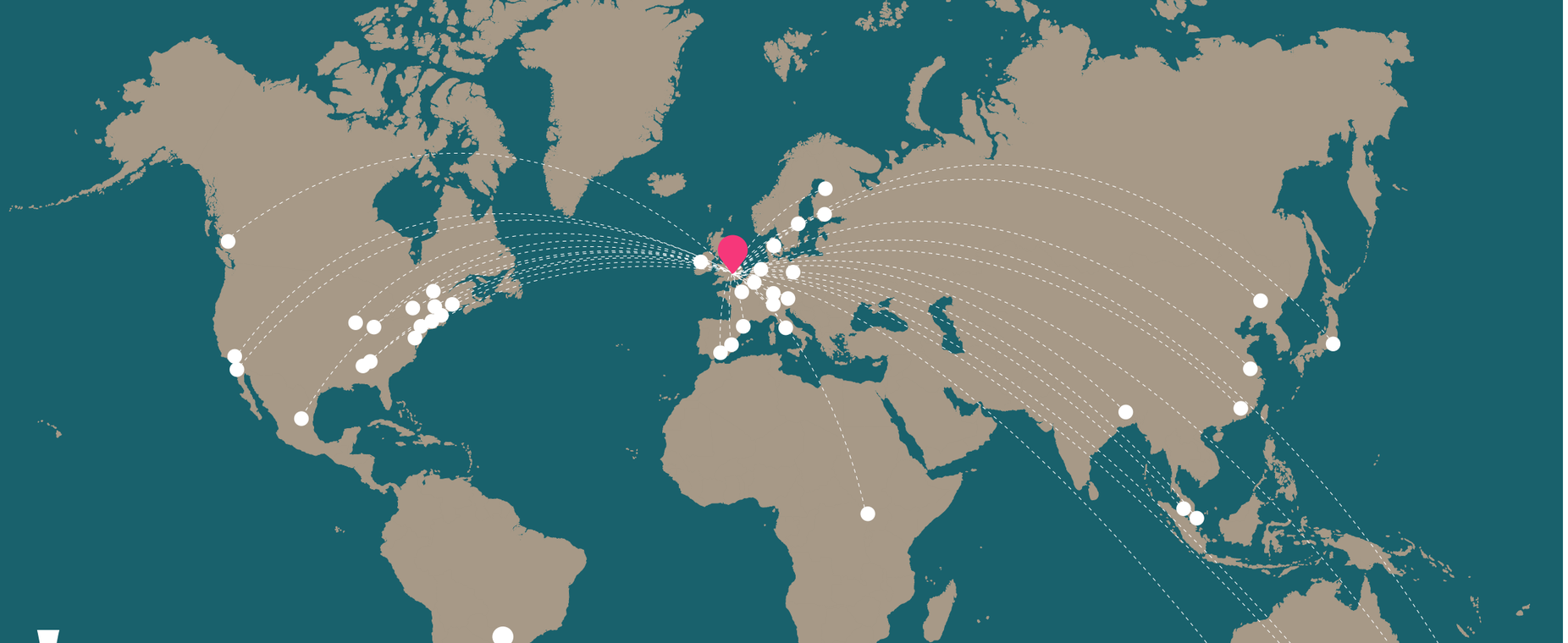
We are bringing together sociodemographic, economic, lifestyle and health data, and are combining this with biological data.

Our ultimate aim is to provide evidence for health policies to prevent cardiometabolic diseases in Bangladesh and other South Asian countries.

We are also building capacity for public health research, by running courses in Bangladesh, and Bangladeshi PhD students have come over to Cambridge to study.

As a clinical epidemiologist, I work with population data. Being in the Institute means we work in close proximity with 'wet labs' that help us understand disease development in patients at a molecular level."

Professor Emanuele Di Angelantonio



Improving health locally and globally

The Institute focuses research efforts on areas of unmet health needs locally and globally.

Our scientists are building connections in communities to better address their health needs. From a large-scale community event in Peterborough to a foodbank in Wrexham, we are finding ways to understand the needs of communities that are often missing from health research.

We are also addressing urgent global health challenges, such as tackling the growing rates of cardio-metabolic disease in Bangladesh, understanding the impact of respiratory failure in Uganda, finding ways to address the global threat of antimicrobial resistance, and improving cardiovascular risk prediction in lower- and middle-income countries.

Keeping cystic fibrosis patients healthy using AI

"Cystic fibrosis is an inherited disease characterised by periods of deteriorating health, called exacerbations, that drive inflammatory lung damage.

We have developed an app that patients can use at home to monitor their blood oxygen, lung function, activity levels and weight to give valuable information about their health.

Now we are running a national clinical trial to combine the app with an AI algorithm to try to predict exacerbations up to 10 days before they happen. This could allow patients to take action to prevent deterioration, such as increasing their adherence to medicines or seeking early medical help.

We are also working to overcome the hurdles faced in developing new antibiotics. Antimicrobial resistance is a major threat to global health, but is also something of particular risk to cystic fibrosis patients."

Professor Andres Floto

Looking to the future

"Our work has already changed and improved care for people in the UK, Europe, and beyond. We are excited about growing the impact of our research over the coming years, in our new surroundings.

In the next year we will build new strategic partnerships with pharmaceutical companies and small and medium enterprises, strengthen our partnership with the NHS, and continue to focus on the unmet needs of patients and populations."

Professor Charlotte Summers, Director

Our Principal Investigators

Professor Andres Floto
Professor Adam Butterworth
Professor Angela Wood
Professor Antonio Vidal-Puig
Professor Charlotte Summers
Professor Clare Bryant
Professor Emanuele Di Angelantonio
Dr Frank McCaughan
Dr Helle Jorgensen
Professor Hugh Markus
Professor James Rudd
Professor John Danesh
Dr Jonathan Fuld
Dr Mark Toshner
Professor Martin Bennett
Professor Mike Inouye
Professor Murray Clarke
Dr Nick Evans
Dr Nick Gleadall
Professor Nicole Soranzo
Dr Samuel Lambert
Dr Stephen Kaptoge
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Dr Xuan Li
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To find out more about contributing to our vital work: **www.hlri.cam.ac.uk**