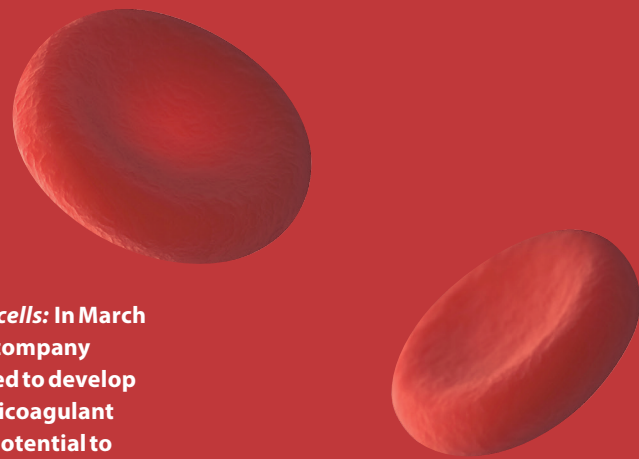




UNIVERSITY OF
CAMBRIDGE
enterprise

Annual Review 2015

Cover image, blood cells: In March 2015, our portfolio company X01 Limited, founded to develop ichorcumab, an anticoagulant antibody with the potential to save millions of lives, was acquired by Janssen Pharmaceuticals, Inc. Ichorcumab is a recombinant human antibody developed to mimic the activity of a human antibody, which appears to produce an anticoagulated state without predisposition to bleeding. It was initially developed by University of Cambridge Professor Jim Huntington, of the Cambridge Institute for Medical Research, and Dr Trevor Baglin, of the Cambridge University Hospitals. Cambridge Enterprise funded the inventors to carry out proof of concept work, provided seed fund investment, put licence agreements in place and helped the founders with the sale of the company.



Who we are

Cambridge Enterprise was formed by the University of Cambridge to help students and staff commercialise their expertise and ideas. Our role is central to the mission of the University, which for more than 800 years has contributed to society through the pursuit of education, learning and research at the highest levels of international excellence.

At Cambridge Enterprise, we help University researchers achieve the impact that's central to securing long-term funding for research. Our success is measured in the achievements of our academic partners as they bring their work to market, be it a promising new performance clothing technology, tracking real-time disease warnings, or the world's first self-learning dialogue program that allows natural conversation between people and their smart devices.

We're here to make the world a better place by helping to create a legacy of products, services and advice that benefit not just the University and the UK, but everyone.





From the Chief Executive

Dr Tony Raven

With its ivy-clad walls and fluttering black gowns, Cambridge has been contributing revolutionary ideas to society for centuries – from establishing the first publishing house, Cambridge University Press, in 1534, to developing Solexa’s genome sequencing technology in 1998, and the thousands of other inventions since. Some 800 years after its founding, the University continues to surprise with a continuous flow of new and exciting commercialisation opportunities, many of which have the potential to change the world.

Take X01 Limited, which this year – just 21 months after spinning-out in a sale that made international headlines – was acquired by Janssen Pharmaceuticals, Inc. (our cover story). Prior to the acquisition, the initial development of X01’s anticoagulant antibody ichorcumab was supported by Cambridge Enterprise’s Life Sciences and Seed Funds teams. It brought together the best of Cambridge’s biotechnology sector to develop a drug that has the potential to save millions of lives. This is just one example of the sort of societal impact that Cambridge makes.

This year, Cambridge Enterprise reached another record high for spin-out investments from a robust **£16 million** seed fund, putting **£3.8 million** into **13** promising companies and supporting the commercial ambitions of more than **1,400 researchers** through funding, licences, patents and administrative help. We are able to do this because of the success of our portfolio of spin-out companies in generating returns that we can reinvest into the next tranche of great ideas.

Among our new investments and agreements were those with Professor Steve Young, a pioneer in the field of spoken dialogue management, whose company VocalIQ (p. 15) we co-funded with Amadeus Capital Partners; biological anthropologist Dr Danny Longman,



who, with the administrative support of Cambridge Enterprise, works as a consultant for Helly Hansen to develop performance clothing technology (p. 16); and Dr Damian Gardiner, whose cutting-edge authentication technology company, which we supported, was acquired by Tracerco (p. 10).

Our growing spin-out portfolio is supported by Cambridge Innovation Capital, a **£50 million** sister fund, created by us to aid mid-stage investment – that critical time when so many companies are prone to fail. The fund is thriving. This year it has invested more than **£9 million** in promising technologies growing out of the University and the wider Cambridge Cluster.

It has been a great year across the whole of Cambridge Enterprise but we are already working hard on how to take that success to new heights.

We are showcasing some of our accomplishments with the launch of a promotional film (p. 20), taking viewers beyond the licences, patents and investments we oversee to illuminate the real-world impact of the research we support.

We owe our growing legacy of achievements to the researchers, academics and students who trust us with their ideas, who value our input and allow us to work with them in bringing their ideas to the marketplace. It’s a privilege to support their work.

For those who haven’t yet worked with Cambridge Enterprise, know that our doors are open. To echo the message of our film, ‘We’re ready for you to show us the next great idea.’

Image opposite: The Hauser Forum, on the University’s West Cambridge Site, is the home of Cambridge Enterprise. To date, our spin-out companies have raised **£1.4 billion** in follow-on funding to grow their businesses, create jobs and strengthen the economy.

What we do and how we do it

It is through Cambridge Enterprise that inventions and ideas are patented, licences are granted, expertise is shared, and funding is acquired by new start-ups and companies spinning out of the University.

Teams from across our organisation bring together expertise in funding, consultancy and intellectual property management (IPM) to provide high-quality support to the University's staff and students who want to commercialise their research or share their knowledge. Funding, advice and contract management is offered to all our academic partners, from the fields of science, technology, engineering, maths and medicine, to the arts, humanities and social sciences.

Whether our academic partners have an idea that's still germinating, expertise to share, or have created intellectual property (IP) that needs protecting, Cambridge Enterprise is here to help them achieve success.

2014–15 by numbers

£11.2m

in operating income raised from licensing and consultancy

1,458

researchers supported

123

commercial and research licences signed

£401k

income from reagents

Our portfolio companies have raised
£1.4bn

in follow-on funding since 1995

£6.5m

in translational funding won with the support of Cambridge Enterprise

359

Consultancy contracts signed

We develop business opportunities, obtain resources, manage contracts and provide financial support – from proof of concept to exit

We have made
£4.3m

in charitable donations to the University since 2006

159
patent applications filed

£16.5m

from equity realisations

Tracking real-time disease warnings

This year, we led the way in investment and licensing support for University spin-out **Fluidic Analytics**. Fluidic Analytics secured a licence from Cambridge Enterprise, as well as £1.56 million from our Seed Funds and other investors, to develop tools to identify the 'protein fingerprints' of disease.

Fluidic Analytics' cutting-edge bioscience technology is based on research conducted by

Professor Tuomas Knowles, of the Department of Chemistry.

In contrast to the use of DNA, whose sequence provides information on the likelihood of developing a disease at some point in life, proteins provide real-time information on the actual disease state of the body. Current information on disease is widely seen as the key to timely, effective medical treatment.

Technology Transfer

Bringing science to market

Helping academics develop their ideas and inventions into opportunities that are attractive to business and investors is at the heart of Cambridge Enterprise and its Technology Transfer team.

We support academics and researchers to bring the most exciting ideas to market, assisting with the formation of new companies and developing licensing opportunities. Often the work is with those whose ideas are still in the very earliest stages of development. This year, the Technology Transfer team signed **123 commercial and research licences** and filed **159 patent applications**.

We deliver proof of concept funding to build prototypes and undertake market analysis, bring together experts to scope and develop new technologies, arrange development funding opportunities (public and charitable), find development partners and investors, and negotiate and manage commercial deals through licensing IP including patents, know-how, data and copyright.

Technology
Transfer invested

£979_k

in patents and
proof of concept
2014–15

The future of biotechnology

Cambridge Enterprise's Life Sciences team works with colleagues from the University and Cambridge University Hospitals (NHS) on technologies from healthcare to agriculture. This year the team completed **22** commercial deals.

The team also worked on the successful sale of **X01 Limited** to Janssen Pharmaceuticals, Inc. X01 was founded to develop ichorcumab, a novel anticoagulant antibody (our cover story), that has the potential to save millions of lives by preventing heart attacks and strokes. Cambridge Enterprise supported the inventors, Professor Jim Huntington, of the Cambridge Institute for Medical Research, and Dr Trevor Baglin, of Cambridge University Hospitals, in their initial efforts to develop this therapeutic, and to build a package of material, data and IP that formed the basis of the company.

Other notable deals included those with **Z-factor Limited**, a drug discovery company created by Professor Huntington to identify and develop therapeutic agents to treat alpha-1-antitrypsin deficiency (one common manifestation of which is emphysema), and the development of a promising project in neuropathic pain, based at the **Stevenage Bioscience Catalyst** (SBC) and formed on the research of Professor Peter McNaughton, who was in the Department of Pharmacology until 2013. This Cambridge Enterprise-backed project is one of four based at the SBC.

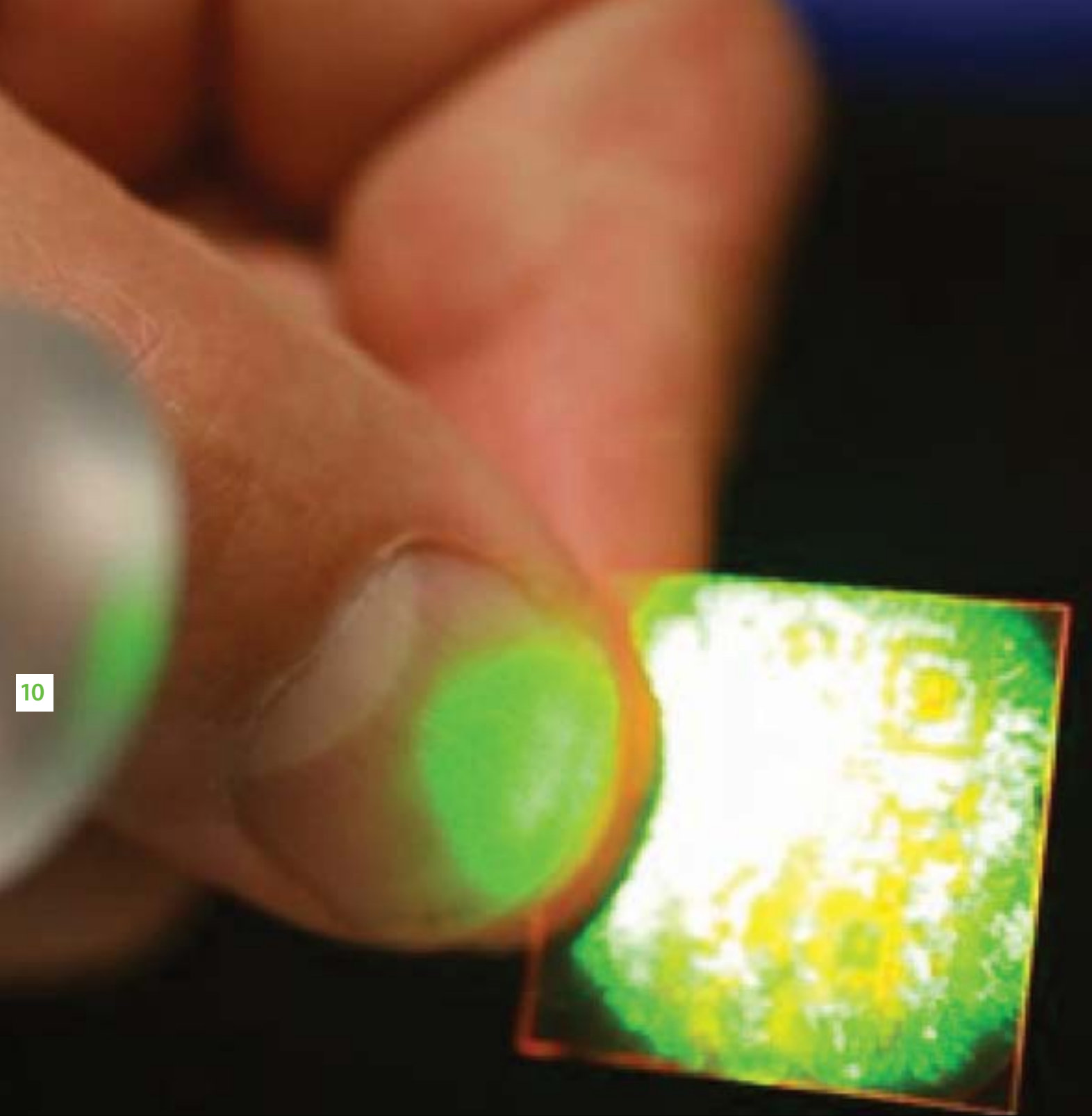
65
translational funding
applications supported with
a potential value of more than
£31.9m
2014-15



Drugging the undruggable

PhoreMost is a spin-out based on work by **Professor Ashok Venkitaraman** and **Dr Grahame Mckenzie**, both of the University's MRC Cancer Unit. This new-model drug discovery company aims to develop drugs against targets previously thought to be 'undruggable', and to bring more effective, targeted medicines to patients. It was co-founded with PhoreMost CEO **Dr Chris Torrance**, a cancer researcher and entrepreneur. Cambridge Enterprise's Life Sciences and Seed Funds teams worked with

the Cambridge-based company, providing patent and licence support, as well as seed investment. PhoreMost has developed a next-generation phenotypic screening platform called Site-Seeker to identify the best new targets for future therapies and how to drug them. Site-Seeker has the potential to significantly increase the diversity of novel therapeutics for cancer and other diseases where treatment options are severely limited.



Authentication made simple

University spin-out **ilumink**, whose authentication technology makes products more resistant to fraud, was acquired this year by Tracerco, a company specialising in detection, diagnostic and measurement solutions that is part of the Johnson Matthey group.

The technology was developed within the University's Electrical Engineering Division, whose team, led by **Dr Damian Gardiner**, established ilumink to pursue commercialisation. Proof of concept and early commercialisation funding was provided

by the Royal Academy of Engineering Enterprise Fellowship Scheme and the Engineering and Physical Sciences Research Council (EPSRC). Patent funding and support was provided by Cambridge Enterprise's Physical Sciences team.

ilumink's technology uses the inkjet printing of liquid crystal laser materials to offer overt, covert and forensic authentication; key applications include anti-counterfeiting and security products. Potential markets range from high-value consumer goods and currency to pharmaceuticals.

Technology Transfer

Physical Sciences

Supporting innovation

Cambridge Enterprise's Physical Sciences team focuses on innovations stemming from many areas of the University, from the Schools of the Physical Sciences and Technology to the Humanities.

The team works to develop long-term relationships between researchers and industry to support effective knowledge transfer. This year it entered into a growing number of option agreements that help forge trust by allowing companies to test-drive exciting new technologies before committing to licence agreements. The technologies range from materials to enhance the performance of solar cells through to sensing systems. The Physical Sciences team completed **28** commercial deals this year.

Among the most significant agreements were those with **Dow Corning**, which was licensed a smart glass technology developed by the groups of Professor Daping Chu and Professor Harry Coles, both of the Department of Engineering; with the not-for-profit **ICThinking (Cambridge) Limited**, which works under the stewardship of Dr Sara Savage and Dr Eolene Boyd-MacMillan, both of the Department of Psychology, to prevent ideological extremism and support conflict resolution (see our film, p. 20); and with **Fluidic Analytics** (p. 6), which has developed game-changing protein analytics based on the research of Professor Tuomas Knowles, of the Department of Chemistry.





Sunset, Kangerdlugssuaq Fjord, East Greenland

Professor Julian A. Dowdeswell, a glaciologist and Director of the Scott Polar Research Institute, works with Cambridge Enterprise, providing advice to several multinational oil and gas companies. His work focuses on the form and flow of modern glaciers and

ice sheets and the impact of climate change, using a variety of satellite and airborne geophysical tools. He also investigates the links between former ice sheets and the marine geological record. Dowdeswell took this photograph while undertaking Arctic fieldwork.

The business of company creation

This year marks the 21st anniversary of University investing and the third straight year that Cambridge Enterprise Seed Funds has broken records, bankrolling 13 promising companies for a total of £3.8 million.

Our investment team supports the creation of companies based directly on University research or people, investing as much as £1 million in each spin-out or start-up from a £16 million evergreen fund. This year alone, Cambridge Enterprise Seed Funds has returned £3.7 million to the fund from the sale of shares in three companies.

Among its many recent investments, Seed Funds supported the work of **Reduse**, whose cutting-edge ‘unprinter’ technology removes print from paper, dramatically cutting CO₂ emissions compared to recycling by reducing the need for pulping, heating and chemicals (Department of Engineering); **Quethera**, a gene therapy start-up developing a treatment for glaucoma that could prevent associated blindness (Department of Clinical Neurosciences); **Silicon Microgravity**, which is developing a technology to detect water within underground oil fields (Department of Engineering); and **Cytora**, a pioneer in the field of risk analytics technology (Centre for Policy Research).

This year we invested
£3.8m
in 13 companies

Straight talk

Cambridge Enterprise invested £375k in the rising star speech-technology spin-out **VocallQ**. VocallQ has developed software that helps people communicate more naturally with their computers – from those in smart devices to those found in cars and homes. The company is the brain-child of its chair **Steve Young**, Professor of Information Engineering, and its CEO and co-founder **Blaise Thomson**, who is an expert in machine learning and dialogue system

design. VocallQ is widely credited with using a fresh approach to solve the challenges presented by existing voice recognition systems.

In 2014, VocallQ began working with a US automotive manufacturer to develop an advanced voice-control system for vehicles that would allow spoken commands to access navigation and entertainment systems and accessories.



Consultancy Services

Applying knowledge and expertise

Cambridge Enterprise's Consultancy Services gives staff, researchers and students dedicated support to apply their knowledge and expertise through the provision of advice, expert witness work, bespoke training or by serving on scientific advisory boards for government, industry and the public sector.

Through consultancy projects, University research can make its earliest direct impact on society. That's why many researchers turn to Consultancy Services to handle the negotiations, the contracts, and the other administrative tasks that can otherwise distract from the transfer of knowledge.

Throughout the year, Consultancy Services has worked closely with more than a hundred academics. These include **Dr Nidhi Singal**, a Senior Lecturer in Inclusive Education at the Faculty of Education, who is consulting with the government of India to analyse education programmes for children with disabilities; **Professor Pauline Rose**, also at the Faculty of Education, whose research is aimed at raising learning outcomes for children from disadvantaged backgrounds in low-income countries; **Dr Krishnaa Mahbubani**, with the Department of Chemical Engineering, who has been working with Woolcool on eco-friendly, high-performance insulated packaging; and **Dr Matt Castle**, a postdoc in the Department of Plant Sciences, who is working with the UK Department for Environment, Food & Rural Affairs on modelling to better understand the risks of pests and disease.

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Engineered for performance

Engineered for performance – whether you're skiing, running or biking in extreme conditions, **Dr Danny Longman's** research is focused on understanding the nature of physical performance. With the help of Cambridge Enterprise's Consultancy Services, the University biological anthropologist is working with outdoor apparel giant **Helly Hansen** to develop the next generation of performance clothing technology. This partnership aims to create

innovative design through an enhanced understanding of the interaction between physiology and technology. It's hoped that the products developed will both improve the experience of users and provide the necessary high-tech insulation, ventilation and performance that athletes and outdoor professionals, such as ski patrollers or sailors working in demanding environments, need.

This year,
with our support,
167 consultants
provided expertise to

203
clients

Supporting the Cambridge Cluster

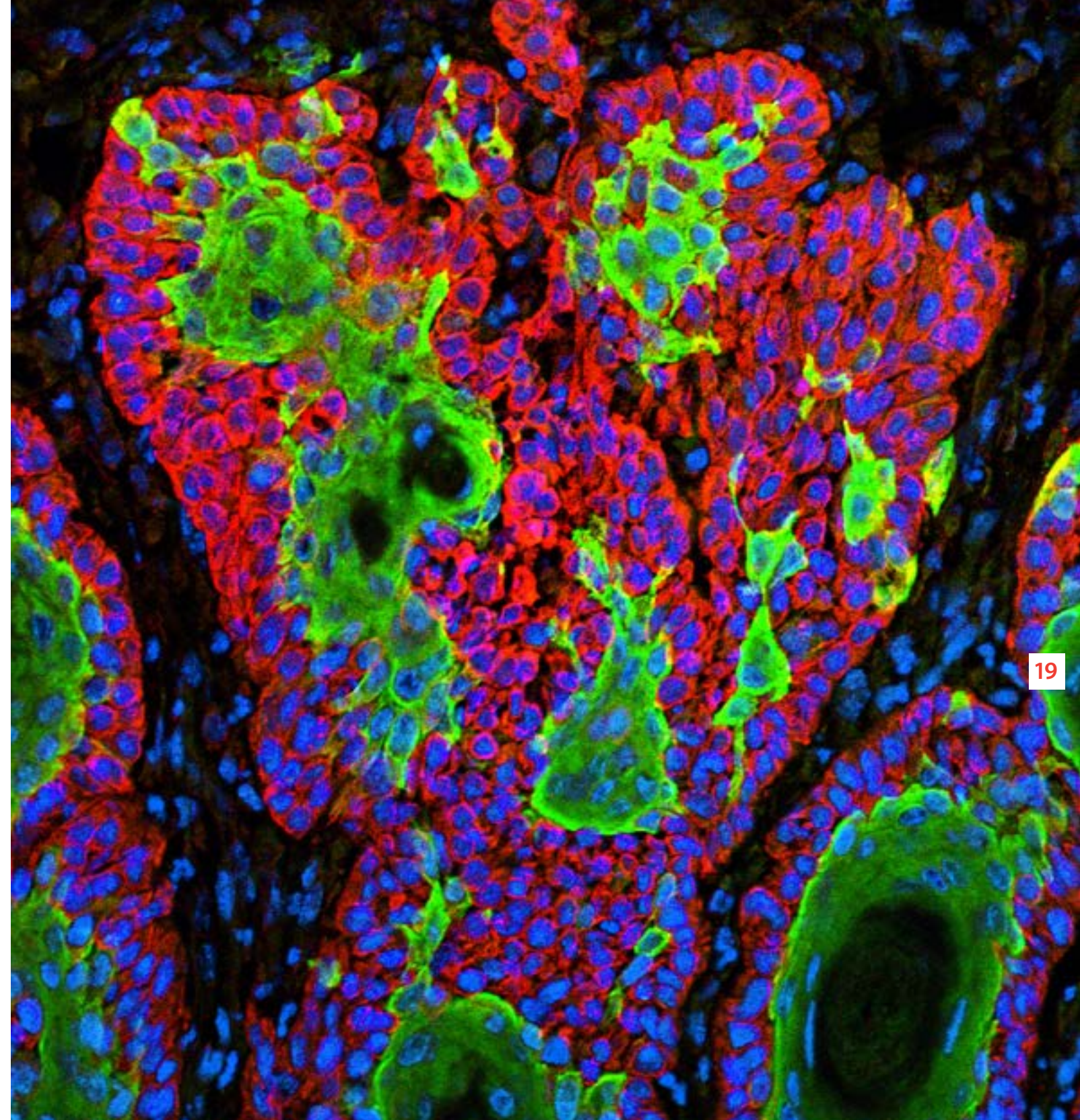
Cambridge Innovation Capital plc (CIC), an investor in high-growth technology companies in the Cambridge Cluster, was established by Cambridge Enterprise and backed by the Cambridge University Endowment Fund, to help emerging spin-outs and start-ups survive the difficult middle stage of commercial development.

This year, CIC made eight investments, totalling £9.7 million, from its £50 million fund.

Among them was £100k funding for **Iceni Therapeutics** (p. 19), which also received £50k from Cambridge Enterprise Seed Funds.

In addition, CIC provided investment to **PragmatIC**, a company producing flexible integrated circuits on plastic, which received £2.3 million; **Inivata**, a spin-out from Cancer Research UK's Cambridge Institute, which received £1.5 million to develop a technology that allows the measurement and evaluation of circulating tumour DNA to improve cancer management; **Congenica**, a spin-out from the Wellcome Trust Sanger Institute, which received £1.5 million to commercialise Sapienia, a genome digital health platform for improving genetic disease diagnostics; **Abcodia**, a clinical stage company engaged in the commercialisation of the ROCA® test for the early detection of ovarian cancer, which received £2 million; and cloud-based video management company **Imagen**, which received £2 million in follow-on funding.

CIC made **8**
investments
totalling
£9.7m
2014-15



Targeting cancer

This year Cambridge Enterprise and Cambridge Innovation Capital (CIC), alongside other funders, invested in **Iceni Therapeutics**, a discovery and development company targeting enzymes that modify RNA using small molecules. The company was spun out of the Gurdon Institute and is based on the work of **Professor Tony Kouzarides** (Cancer Biology) and **Professor Eric Miska** (Molecular Genetics), who are both working with Cambridge Enterprise Consultancy Services to provide scientific advisory services to Iceni.

During the current investment stage, Iceni is working with the Technology Transfer team to put in place licences for translational projects, from each of the principal investigators' labs, to form the foundation of Iceni's drug discovery programme.

The company's work focuses on identifying and developing candidate drug molecules as potential first-in-class targeted products for cancers where there is an unmet need. The seed round was £600k with the expectation of significant follow-on investment.



Enterprise Champions

Enterprise Champions act as liaisons between Cambridge Enterprise and fellow researchers and academics who want advice on bringing their ideas and expertise to market. They encourage colleagues to consider commercialisation and consultancy when it's appropriate. This year the programme grew by a third to 68 Champions.

Our Champions hail from a wide range of backgrounds – from those doing collaborative corporate research and starting companies, to others fundraising and balancing the demands of academic research and business.

Enterprise Champions meet several times a year to share departmental research priorities and 'hot' technologies, and to critique Cambridge Enterprise's performance.



Dr Andrea Kells (Computer Laboratory), **Dr Paul Mantle** (Materials Science and Metallurgy) and **Alexandra Bolton** (Engineering).

Industry Engagement Forums

Cambridge Enterprise Industry Engagement Forums encourage academics at all stages of their careers to think broadly about their work.

In the Forums, academics are challenged to better understand how their research can be used to create impact in both commercial and humanitarian contexts, while non-profit organisations and industry gain access to world-leading research expertise.

During the one-day brainstorming events, participants are invited to put forward themes related

to their industry. Working together in small groups, participants identify areas of common interest that may lead to future research collaborations, studentships and secondments. Participants have included ARM, the British Antarctic Survey, Element Six, Save the Children, British Petroleum (BP), Unilever, UNICEF, UNESCO, the International Red Cross, Pfizer and the World Bank, as well as University academics, researchers and PhD students from the social sciences and humanities, science, technology, engineering and mathematics (STEM).

International Outreach Programme

It's through our International Outreach Programme (IOP) that Cambridge Enterprise provides advice, training and support to governments and universities around the globe that want to improve the commercialisation of their research and knowledge base.

To date, Cambridge Enterprise has helped academic and government partners in Brazil, Chile, Thailand, Saudi Arabia, Norway, China, Colombia, the Czech Republic, Mexico and southern African countries.

This year the IOP welcomed 75 scientists from Poland for a nine-week course on commercialisation. The programme was part of an ongoing effort by the Polish Ministry of Science and Higher Education to bridge the gap between academia and business. Participants were taught many of the skills they need to manage co-operative research projects in Poland and bring high-tech products to market. The course focused on innovation, IP and technology transfer, entrepreneurship and leadership.

"Alright Mr DeMille, I'm ready for my close-up"

In 2015, Cambridge Enterprise unveiled a new corporate film. The quirky take on innovation showcases some of the world-changing ideas and inventions that have been developed with our help. The video, which has been watched more than 45,000 times, employs a chain reaction device to highlight a drug that has the potential to save millions of lives (ichorcumab – our cover story); software that

creates unique music at the touch of a button; a flower seed mix that helps the UK's bee population survive and flourish; a critical suspension technology used in Formula 1 racing; a programme to prevent ideological extremism and intergroup conflict; and a breakthrough in DNA sequencing technology. You can watch the film and the companion 'making of' video by visiting www.enterprise.cam.ac.uk

Financial performance 2014–15

Cambridge Enterprise income

| Year to 31 July | 2014–15 £000 | 2013–14 £000 |
|---|-----------------|-----------------|
| Income generated by Cambridge Enterprise operations | 11,182 | 10,731 |
| University and Higher Education Innovation Fund (HEIF) funding | 1,489 | 1,538 |
| Income for services and other income | 827 | 871 |
| Income before returns from equity realisation | 13,498 | 13,140 |
| Equity income to Cambridge Enterprise and University Seed Funds | 16,492 | 5,720 |
| Total income | 29,990 | 18,860 |

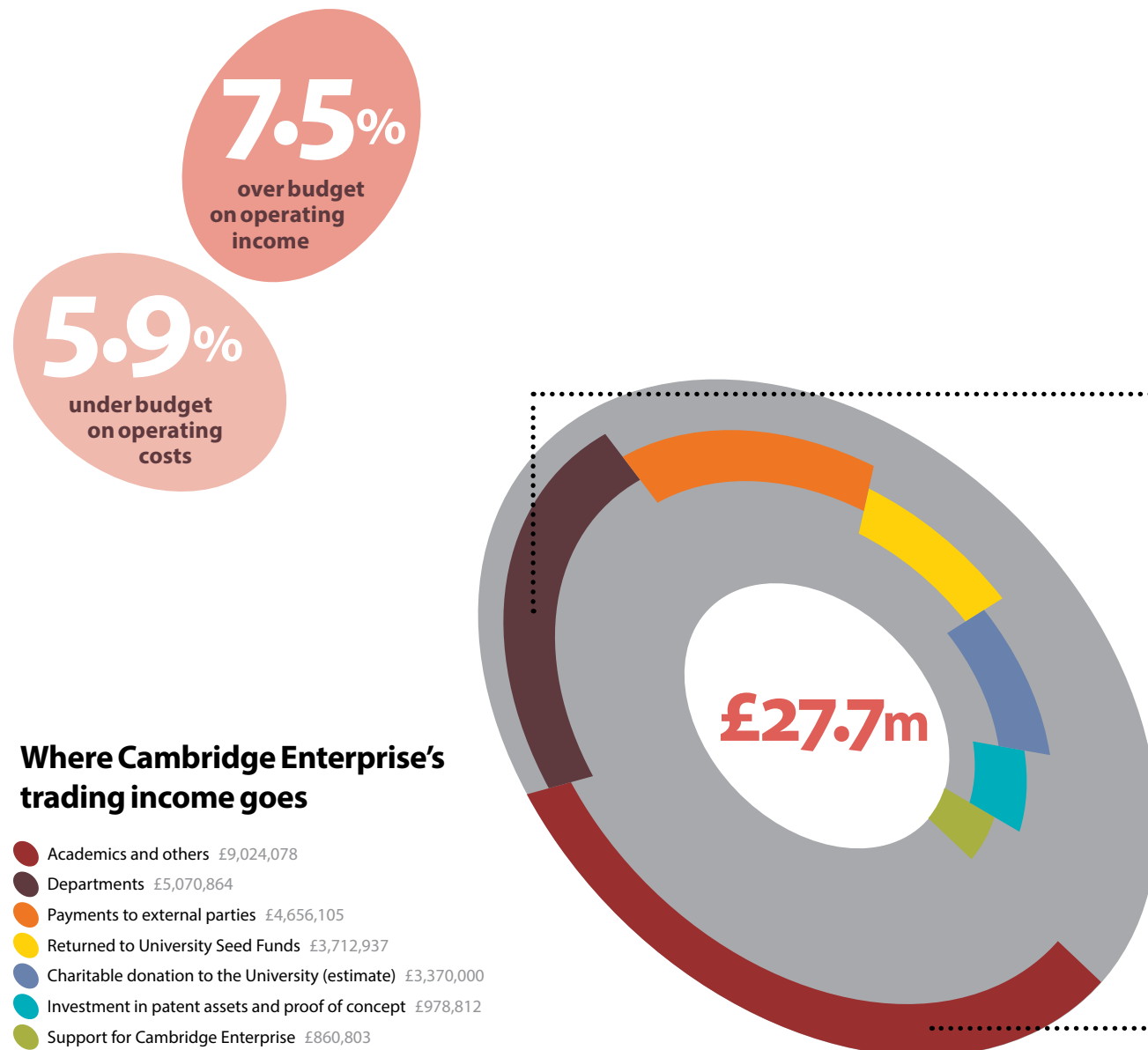
Cambridge Enterprise IP investment, distributions and operating costs

| Year to 31 July | 2014–15 £000 | 2013–14 £000 |
|--|-----------------|-----------------|
| Investment in IP assets (patent and proof of concept) | (979) | (1,013) |
| Distributions to academics and external parties | (13,680) | (6,781) |
| Distributions to University (departments' share of IP and gift aid from academics) | (8,441) | (2,265) |
| Returns to University of Cambridge Seed Funds | (3,713) | (5,661) |
| Operating costs (staff and other costs) | (3,333) | (3,160) |
| Total expenditure | (30,146) | (18,880) |
| Net income/(expenditure) for the year | (156) | (20) |

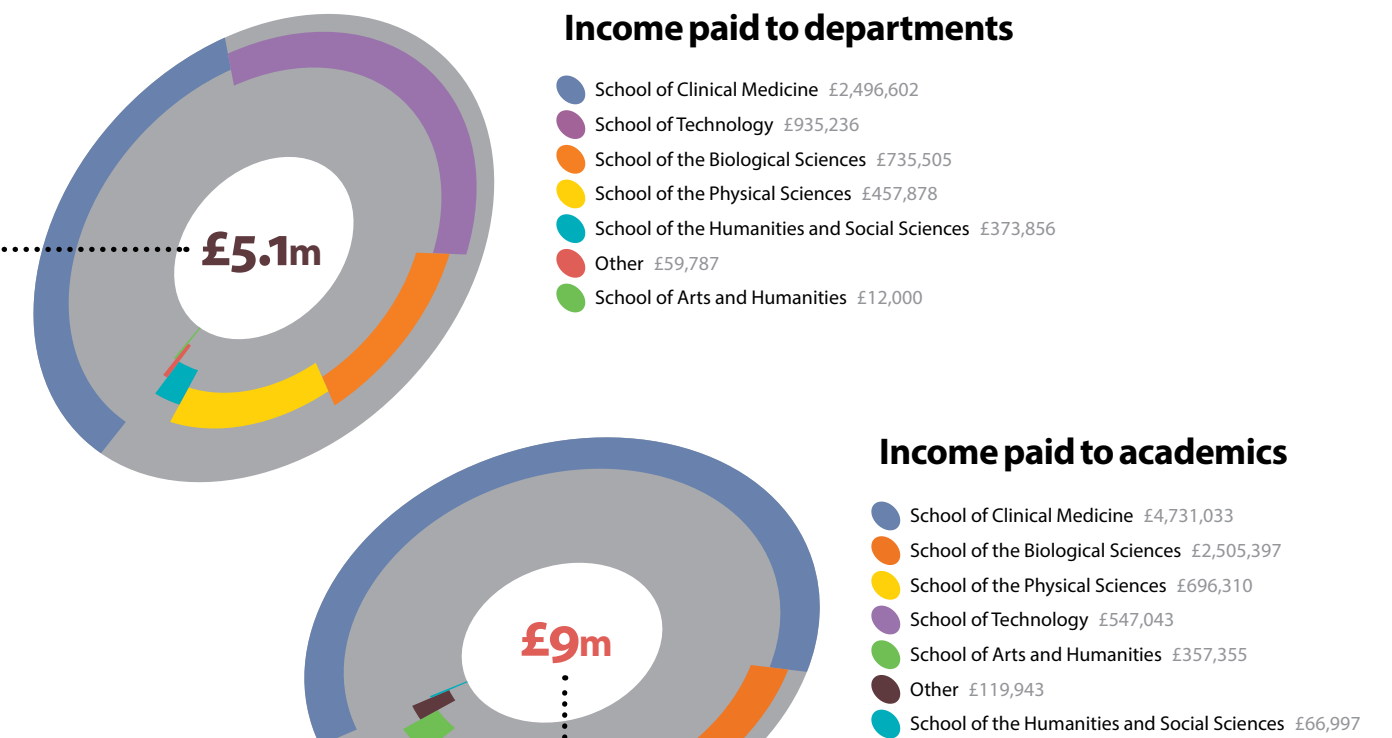
Group accounts

The group income and expenditure summary comprises consolidated results for Cambridge Enterprise Limited and its wholly owned subsidiary company, Cambridge University Technical Services Limited, presented in a management accounts format.

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Equity portfolio

Cambridge Enterprise held equity in **65 companies** from August 2014 to July 2015.

Governance and structure

Cambridge Enterprise is a wholly owned affiliate of the University of Cambridge.

Board of Directors

Chair

Sir Keith O'Nions

Non-Executive Directors

Professor Alan Blackwell

Reader in Interdisciplinary Design

Charles Cotton

Cambridge Phenomenon Limited

Professor Lynn Gladden *(until 31/12/15)*

Pro-Vice-Chancellor (Research)

Dr Mike Lynch *(until 11/12/14)*

Technology entrepreneur

Dr Jane Osbourn *(from 25/09/15)*

Vice President of Research & Development, MedImmune

Debu Purkayastha *(from 25/09/15)*

Entrepreneur-in-Residence, Octopus Investments

Professor Nigel Slater *(from 01/01/16)*

Pro-Vice-Chancellor (Enterprise)

Professor Florin Udrea

Professor of Semiconductor Engineering

Executive Directors

Dr Tony Raven

Chief Executive

Dr Paul Seabright

Deputy Director

Dr Richard Jennings *(until 30/03/15)*

Deputy Director

Company Secretary

Dr Jonathan Nicholls

Registry, University of Cambridge

Nominated Officer of the Shareholder

Andrew Reid

Director of Finance, University of Cambridge

Senior Management Team

Dr Tony Raven

Chief Executive

Dr Paul Seabright

Deputy Director

Boris Bouqueniaux

Head of Support Services

Dr Anne Dobrée

Head of Seed Funds

Dr Malcolm Grimshaw

Head of Physical Sciences

Shirley Jamieson

Head of Marketing

Mark Parsons

Head of Finance & Accounting

Dr Iain Thomas

Head of Life Sciences

Dr Amanda Zeffman

Head of Consultancy Services

Investment Committee

Charles Cotton

Cambridge Phenomenon Limited

Dr Barbara Domayne-Hayman

Biotechnology entrepreneur

Dr Hermann Hauser

Amadeus Capital Partners Limited

Dr Andrew Herbert

Computer technology entrepreneur

Dr Derek Jones

Babraham Bioscience Technologies Limited

Dr Henry Kressel

Warburg Pincus LLC

John Lee (Chair)

DisplayLink Limited

Professor Chris Lowe

Professor, Institute of Biotechnology

Professor Duncan Maskell

Senior Pro-Vice-Chancellor

Professor Sir Keith Peters

Emeritus Regius Professor of Physic

Dr Tony Raven

Cambridge Enterprise Limited

Andrew Sandham

Biotechnology entrepreneur

Dr Robert Swann

Technology entrepreneur

Professor Steve Young

Professor of Information Engineering

A microscopic view of numerous red blood cells, appearing as bright red, biconcave discs against a dark background. The cells are scattered across the frame, with some in sharp focus and others blurred in the foreground and background.

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