cambridge enterprise

commercialising University science
for the benefit of society

Annual Review 2010

UNIVERSITY OF CAMBRIDGE

From the Pro-Vice-Chancellor (Research)

Professor Lynn Gladden

This year marks the 50th anniversary of the Cambridge Phenomenon, one of the most productive and innovative technology clusters in the world and one that has the University and its research at its very heart. Over the intervening years, Cambridge Enterprise, as well as other organisations that have been established by the University and its Colleges such as the Cambridge Science Park, St John's Innovation Centre, Peterhouse Technology Park and most recently the Hauser Forum and the ideaSpace, have provided, and continue to provide, some of the support that is essential if early stage businesses are to succeed.

Today, in times of increasing recognition of the importance of identifying the value of research, the work of Cambridge Enterprise in commercialising research results is more important than ever. In particular, it is central to both an innovation-based economic recovery and the communication of the benefits of the University.

Cambridge Enterprise is demonstrating clearly and objectively that the outcomes of research and scholarly activities coupled with best practice in technology transfer are having a very positive economic and societal impact.

Professor Lynn Gladden
Pro-Vice-Chancellor (Research)
University of Cambridge

From the Chief Executive

Teri Willey

This Review marks three successful years for Cambridge Enterprise, during which time income from licensing, consultancy and equity transactions exceeded £27 million. Over £22 million of that amount was returned to the University and to the researchers whose ideas are the foundation of important products and businesses.

The Cambridge Enterprise team currently supports close to 1,000 University researchers at all stages of the commercialisation process. Over the past three years, £3.9 million in translational and proof of concept funding for 67 projects was awarded to Cambridge researchers with the assistance of the team. Some 878 transactions were completed leading to more and more products reaching the market through our licensing activities. The number of consultancy projects continues to grow unabated, with a 73% increase in projects over the past three years. Our Cambridge Enterprise Seed Funds team provides advice and financial support for some of the most exciting companies originating from University research. Since the establishment of the Seed Funds in 1995, our investee companies have successfully raised close to £600 million in funding, representing a leverage of 75 times the University investment.

Many thanks to all our directors, staff, academic partners and business colleagues for their vital part in ensuring the continuing and future impact of Cambridge innovation, and to the Hauser-Raspe Foundation for providing purpose-built offices critical to fulfilling our mandate.

Teri Willey
Chief Executive
Cambridge Enterprise Limited

Cambridge Enterprise – Seven principles

1. Attract and accept into the portfolio those cases that have the strongest potential to make a significant positive impact and where using commercial channels are the most reasonable means to carry the idea forward
2. Take the course of action that supports commercialisation of the technology and work creatively to add value (or to de-risk) the idea through the use of patent, proof of concept, and internal and external evaluation resources
3. Work effectively with University inventors, experts and innovators to support their aspirations, manage conflicts, comply with University regulations and encourage synergy with the mission of the University
4. Engage with industry and investors at an early stage to understand their requirements and find the best partner (including licensee or start-up management and investors) to take the ideas forward
5. Negotiate fair and reasonable terms that reflect the contribution of the assets and expertise being transferred
6. Negotiate and close the greatest number of the best possible deals
7. Look after the deals once they are closed to encourage commercialisation and optimise returns

Cambridge Enterprise delivers its mandate through three overlapping business units

1. Technology Transfer Services

Services include providing support to academics in securing research and development funding; invention disclosure management; patent strategy, filing and maintenance; proof of concept funding; research reagents transfer; intellectual property licensing and contract management; income distribution and bespoke marketing.

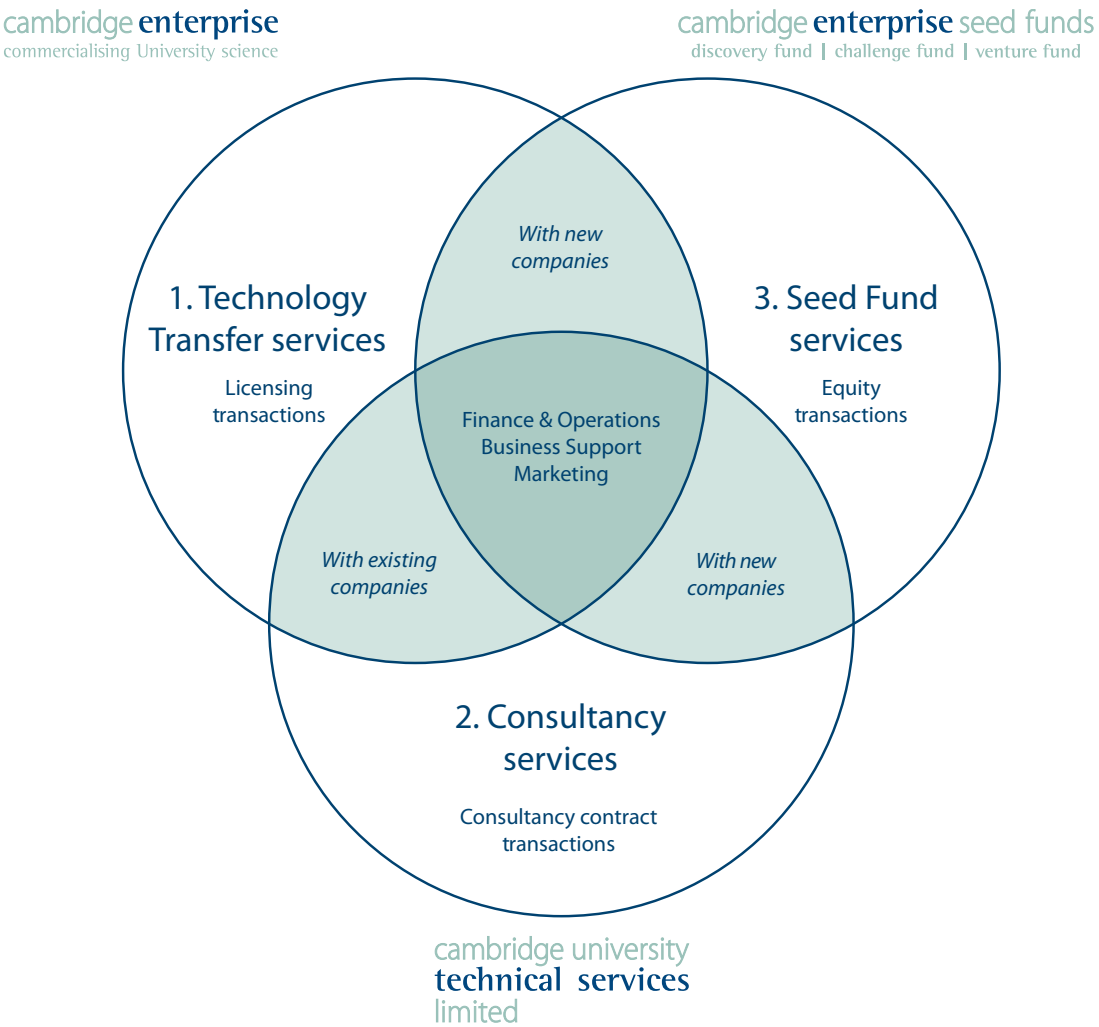
2. Consultancy Services

Services include support for University staff and research groups wishing to provide expert advice or facilities to public and private sector organisations worldwide. They include negotiation of contract terms; assistance with costing and pricing; provision of insurance cover; formal arrangements for use of University facilities; invoicing; debt collection; and income distribution.

3. Seed Fund Services

Services include access to capital and expertise via Cambridge Enterprise Seed Funds and the Investment Committee; angel and early stage investors through Cambridge Enterprise Venture Partners; equity portfolio management; business planning, mentoring and bespoke marketing.

The Finance & Operations, Business Support and Marketing teams support all three business units through bespoke management information systems and best business practice. Through these resources, project information can be linked back to the source of the original research funding, helping academics, funders and the University to track research throughout the commercialisation process.



Key performance indicators

Consultancy, licence and equity transactions are contractual demonstrations of commitment to transfer knowledge or commercialise the results of research and scholarly activities from Cambridge. Income from these is a demonstration of the value recognised in the marketplace, which requires and utilises the skills of a highly skilled workforce, supports the tax base and more.

Group performance indicators for the financial year 2009/10:

- **415 disclosures**
- **277 transactions**
- **£8.4 million income**
- **£6.6 million returned to the University, academics and others**
- **561 active agreements under management including 167 research licences**

Comprised of:

147 new IP disclosures received

124 patent applications filed

97 IP transactions signed: 73 for commercial purposes and 24 for other purposes, including research licences

37 proof of concept projects and follow-on funding projects supported by Cambridge Enterprise; 21 projects awarded funding totalling £660,000, of which £145,000 was awarded from Cambridge Enterprise's proof of concept fund

209 consultancy disclosures received (new consultancy projects)

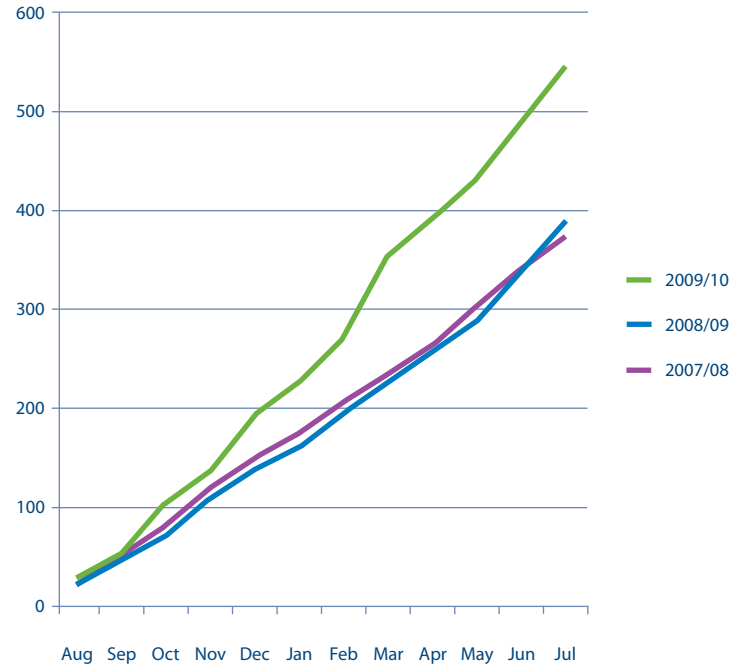
165 consultancy agreements signed

59 new business ideas disclosed and reviewed

11 companies contributing new equity to the portfolio, of which 8 were new companies to the portfolio, and 3 through further follow-on funding

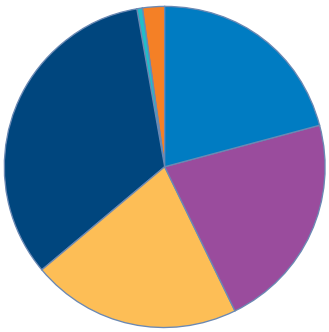
72 companies in which Cambridge Enterprise holds equity

Cumulative transactions for each of the past three financial years



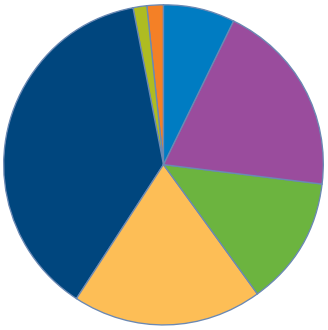
Performance and activity indicators by School

Invention disclosures by School 2009/10



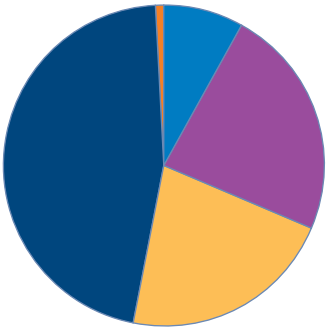
- Arts and Humanities
- Biological Sciences
- Clinical Medicine
- Physical Sciences
- Technology
- Institutions independent of any School

Consultancy disclosures by School 2009/10



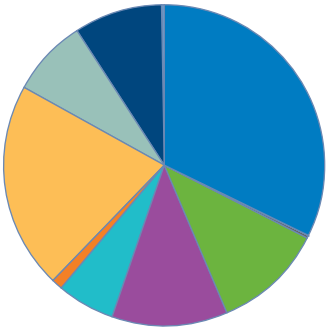
- Biological Sciences
- Clinical Medicine
- Humanities and Social Sciences
- Physical Sciences
- Technology
- Cambridge Enterprise
- Institutions independent of any School

Patent filings by School 2009/10



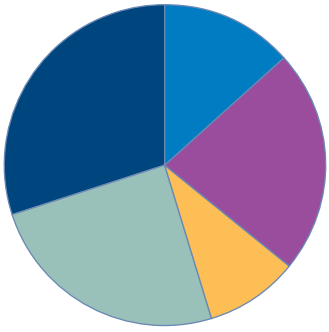
- Biological Sciences
- Clinical Medicine
- Physical Sciences
- Technology
- Institutions independent of any School

Income distribution by School 2009/10



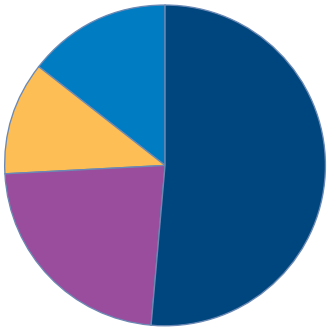
- Arts and Humanities (Consultancy)
- Biological Sciences (Consultancy)
- Biological Sciences (Licensing)
- Clinical Medicine (Consultancy)
- Clinical Medicine (Licensing)
- Humanities and Social Sciences (Consultancy)
- Humanities and Social Sciences (Licensing)
- Physical Sciences (Consultancy)
- Physical Sciences (Licensing)
- Technology (Consultancy)
- Technology (Licensing)
- Other (Consultancy)
- Other (Licensing)

IP transactions completed by School 2009/10



- Biological Sciences (Commercial Agreements)
- Clinical Medicine (Commercial Agreements)
- Physical Sciences (Commercial Agreements)
- Physical Sciences (Research Licences)
- Technology (Commercial Agreements)

IP transactions completed by region 2009/10



- United Kingdom
- Other Europe
- USA
- Rest of World

Cambridge Enterprise and the Schools of the University

The University of Cambridge is one of the world's leading research universities, and Cambridge Enterprise staff work closely with departments, institutes and Schools to support academics interested in using commercial channels for disseminating their ideas and expertise. Commercialisation activities are integral to the research strategy of the University in meeting obligations to its multitude of stakeholders.

A key part of this effort are the Enterprise Champions (and Business Fellows): individuals approved by their Head of Department to liaise with Cambridge Enterprise and who act as departmental advocates for the commercial distribution of ideas and expertise. Enterprise Champions are colleagues of, and a valued resource for, academics who are interested in transferring their knowledge to industry and to society through commercial channels. They carry out their work across a wide range of University departments.

Commercialisation of research can occur in many different ways and takes place across a wide range of disciplines. The Cambridge Enterprise team engaged in over 1,000 different projects this year, from across the University's six Schools. Below are just a few examples of the work undertaken by the team over the past year.

Arts and Humanities

Dr Minna Sunikka-Blank of the Department of Architecture conducted a social and technical performance monitoring analysis for PRP Architects Ltd, aiming to discover how and why tenants alter their energy use habits as part of 'Retrofit for the Future,' an initiative of the Technology Strategy Board which aims to retrofit social housing to meet future emissions targets. Michael Ramage, also of the Department of Architecture, designed and supervised the installation of a brick and mortar dome structure for 'The Bowls Project', part of the annual New Frequencies Music Festival presented by the Yerba Buena Center for the Arts, San Francisco.

Enterprise Champions: Dr Paula Buttery (Research Centre for English & Applied Linguistics), Michael Ramage (Architecture)

Biological Sciences

A field-specific licence for an antibody engineering technology was extended to all fields with pharmaceutical giant Pfizer. The technology, developed by a team led by Dr Mike Clark of the Department of Pathology and by Dr Lorna Williamson of the Department of Haematology, has already been incorporated into Pfizer's tanezumab, which is currently in clinical trials for pain relief. Pfizer now wishes to have greater access to the technology for use in other therapeutic antibodies in development.

Enterprise Champions: Dr David Aldridge (Zoology), Dr Raymond Bujdoso (Veterinary Medicine), Dr Emily Clemente (Pathology), Professor Bill Colledge (Physiology, Development & Neuroscience), Dr Tai-Ping Fan (Pharmacology), Dr Andrea Kells (Biological Sciences), Professor Peter Leadlay (Biochemistry), Professor Brian Moore (Experimental Psychology), Dr Beatrix Schlarb-Ridley (Plant Sciences), Dr David Summers (Genetics)

Clinical Medicine

Cambridge Enterprise has funded the development of several technologies with huge potential medical impact, including the Cambridge CS Controller developed by Professor of Clinical MRI, David J. Lomas, that makes interrogating 3D MRI data intuitive and straightforward. Dr Peter Smielewski, developer of the ICM+ software which provides improved data monitoring in intensive care settings, customised and installed the software and provided training in its use to many hospitals and universities worldwide.

Enterprise Champions: Dr Maria Adams (Metabolic Research Laboratories), Dr Steve Charnock-Jones (Obstetrics & Gynaecology), Dr Anthony Davenport (Clinical Pharmacology), Professor David Rubinsztein (Cambridge Institute for Medical Research)

Humanities and Social Sciences

The expertise of Cambridge academics in the humanities and social sciences is in great demand from organisations in the UK and around the world who wish to engage them as consultants. For example, David Whitebread (Faculty of Education) who is a member of the LEGO Learning Institute, collaborated with the LEGO Group on a research project defining the types of, and ways to facilitate the kind of play most conducive to children's positive development, their creativity and learning potential. The research will be publicly available in Spring 2011. Professor David Newbery (Faculty of Economics) wrote an analysis of policy options for the funding of a carbon capture and storage demonstration plant in the UK; and Professor David Farrington (Institute of Criminology) completed a feasibility study for the National Policing Improvement Agency on the impact of CCTV upon criminal justice outcomes.

Enterprise Champions: David Carter (Education), Dr Guglielmo Verdirame (Lauterpacht Centre for International Law)

Physical Sciences

Professor John Pyle of the Department of Chemistry served as co-chair of the WMO/UNEP Scientific Assessments of Ozone Depletion for the Department for Environment, Food and Rural Affairs. Camtology, co-founded by Dr Mike Hobson and Professor Andy Parker of the Department of Physics, is a seed funded start-up that has combined two market tested, world-leading technologies in text and image processing to create a unique solution for scientific search and information extraction.

Enterprise Champions: Professor Stephen Elliott (Chemistry), Dr Rachel Hobson (Materials Science & Metallurgy), Professor Frank Kelly (Pure Mathematics and Mathematical Statistics), Professor David Klenerman (Chemistry), Professor Chris Lowe (Chemical Engineering & Biotechnology), Professor Mike Payne (Physics), Michael Simmons (Physics)

Technology

Professor Kenichi Soga of the Department of Engineering, who specialises in the monitoring of ground movements where structures such as tunnels have been constructed, completed several consultancy agreements this year. Enval Limited, a spin-out from the Department of Chemical Engineering and Biotechnology, was commissioned by Canadian company Montebello Packaging to test its patented plastic laminate recycling method on Montebello's laminate tubes.

Enterprise Champions: Professor Ted Briscoe (Computer Laboratory), Philip Guildford (Engineering), Dr Tim Minshall (Institute for Manufacturing), Professor Florin Udrea (Electrical Engineering), Dr Shai Vyakarnam (Centre for Entrepreneurial Learning)

Dan Wheeler

Making drug delivery safer

More than 10,000 drug administration errors involving injectable medicines are reported every year in the UK alone, with thousands more likely going unreported. Such errors can result in harm to the patient and, in some cases, even death. Drug administration errors can lead to increased costs for health care providers from extra bed days, administration costs and even potential litigation.

Syringe mislabelling is a common source of drug administration errors, especially in busy environments such as operating theatres. Currently, the vast majority of syringes that are used to administer drugs to patients are labelled manually, increasing the risk of human error and the possibility that the wrong medication will be given to the patient. The majority of injectable medications administered to patients are stored in small glass ampoules. The ampoules are opened by snapping them off at the neck, and nurses and clinicians risk being cut on the broken glass when drawing the drug into a syringe.

Dr Daniel Wheeler, an anaesthetist in the Department of Medicine, has developed a new ampoule-packaging device called SAFER*amp*™. The device fits around an ampoule, snaps it open, and automatically labels the syringe while withdrawing the medication, thereby protecting the user from any sharp edges and containing any glass fragments.

SAFER*amp*™ provides numerous benefits to patients, nurses, clinicians and health care providers. No other device currently on the market offers a fail-safe method for labelling syringes correctly in a secure procedure, combined with a convenient way to open and dispose of glass ampoules.

Cambridge Enterprise was approached by Dr Wheeler when SAFER*amp*™ was simply a conceptual drawing. Proof of concept funding was invested to contract Cambridge-based design consultancy EG Technology Ltd for design development and refinement. Two series of prototypes have been produced, and it is hoped that trials of the device will begin in the first half of 2011.

Gaining momentum

Business activity

During 2009/10 the Life Sciences team concluded 53 licences for inventions arising from a wide range of research areas. The number of transactions continues to increase, as does the number of products reaching market and generating revenue for academics and their departments.

Some highlights from the past year include several licences signed with Psynova Neurotech, a company that specialises in the commercial development and exploitation of novel biomarkers for neuropsychiatric and other mental illnesses. A licence was signed to X-POL Biotech SL (part of Genetrix) for Professor Aidan Doherty's novel DNA ligase system, a research tool which can save time, effort and money for molecular biologists.

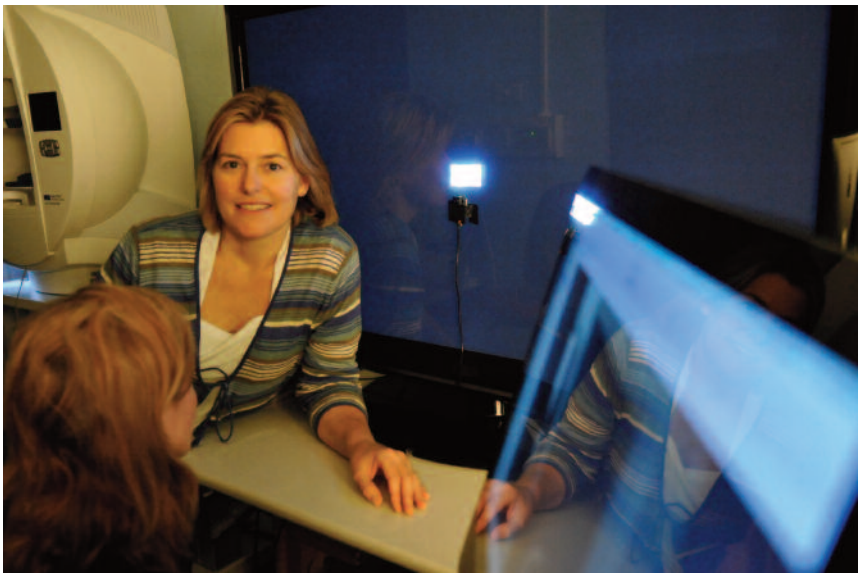
Other products include Dr Lisa Saksida and Dr Timothy Bussey's tool for cognitive testing in rodents, initially disclosed in 2004, which is now sold worldwide through Campden Instruments Ltd.

The technology transfer team also acts as a facilitator for academics, helping them make connections and build networks with valuable partners in the commercialisation process, including the Entrepreneurs in Residence at Eli Lilly, i-Teams Cambridge and the Design Council's Innovate for Universities programme.

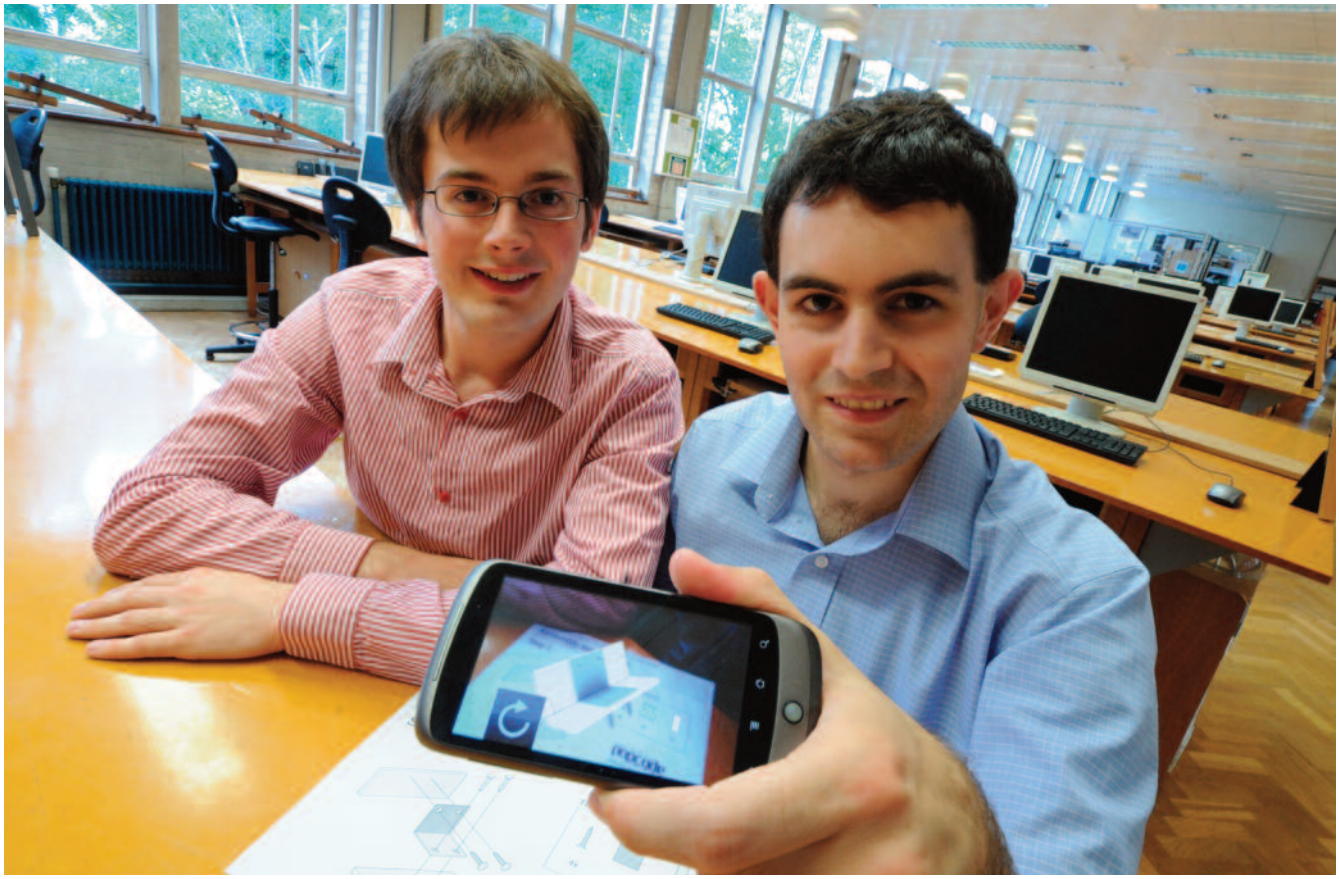
Proof of concept

The use of translational funding to support proof of concept experiments continues to be a major focus of the team. Cambridge Enterprise works to support academics starting from the earliest stages of the commercialisation process, through providing funding to attend conferences, to supporting the development of design prototypes. One of the academics supported this year was Dr Louise Allen of the Department of Medicine, who received funding to develop the software and hardware used in a specialised visual field test system to detect vision defects in children.

The Life Sciences team also supported academics in their applications to various funding bodies, including that for Professor Chris Abell's (Department of Chemistry) Wellcome Trust Seeding Drug Discovery application. The Trust awarded over £2.4 million to Professor Abell and his colleagues to use fragment-based approaches to design and make molecules that disrupt the interaction of two important proteins in human cells, the recombinase RAD51 and the product of the breast cancer-associated gene BRCA2. The team also supported a successful Biotechnology and Biological Sciences Research Council (BBSRC) Follow-on Funding application for a new multiplex immunoassay device developed by Dr Nuno Reis (Department of Chemical Engineering and Biotechnology) and Dr Alexander Edwards (University of Reading), in collaboration with Professors Nigel Slater and Malcolm Mackley (Department of Chemical Engineering and Biotechnology). Cambridge Enterprise invested its own proof of concept funds to support a variety of design work, prototyping, market research and specialist advice.



Louise Allen



Connell Gauld, Simon Taylor

Even better than the real thing

Augmented reality brings together real and virtual worlds. Simon Taylor and Connell Gauld, two graduate students in the Department of Engineering, along with Senior Lecturer Dr Tom Drummond, have developed an augmented reality application which could change the way we use smartphones.

There are already augmented reality technologies on the market in which users can hold their smartphone up to a particular point of interest and the phone's screen will give the user information on what they are looking at. Most of these applications rely on the phone's GPS system combined with a compass reading in order to determine what the phone is 'seeing'.

The technology developed by Taylor, Gauld and Drummond differs in that it processes the images from the phone camera directly, using the smartphone's processor in order to recognise real-world features. The software allows the phone to compute the position of a known target in an image relative to the phone's camera, which allows for accurate overlay of virtual information on the camera image of the real object. The method is fast enough to work in real time on a smartphone, using live video from the phone's camera.

The team has built a framework for describing the content to be displayed, along with interactivity, animation and sound. These are all delivered to their cross-platform augmented reality player application, called Popcode. Users are alerted to the existence of additional content related to an object with the use of Popcodes – a combination of a logo and barcode. When the application views a Popcode, it fetches the content from the internet and then displays it to the user.

Cambridge Enterprise provided support to the inventors in resolving a complicated IP situation with a large corporation. Cambridge Enterprise has now licensed the technology to Korean-based augmented reality company Zenitum, as well as to Extra Reality Limited, the company formed by its inventors, Taylor, Gauld and Drummond.

The inventors are now talking with potential customers about incorporating their software into additional products.

Commercialising research

This year, two of our technologies took the next step in the commercialisation process through the formation of new companies. Sphere Fluidics, which is based on research originating in the Department of Chemistry, became the second company to receive funding from the University of Cambridge Discovery Fund. Amantys Limited, a spin-out from the Department of Engineering based on Dr Patrick Palmer's technology to control power semiconductor devices, is developing a dramatically simplified medium voltage design for high power wind turbines.

Over the past year, 48 IP agreements were signed off in the Physical Sciences – 24 research licences and 24 licences for commercial purposes, including a licence to Strata Technology for Professor Malcolm Mackley's Multipass Rheometer, a laboratory device which measures the way in which a liquid or suspension responds to applied force.

Software continues to be an area of significant activity for the Physical Sciences team, with licences to Rolls-Royce for Professor Howard Hodson's HGraph software; several licences for the Turbostream software developed by Tobias Brandvik, Professor John Denton and Dr Graham Pullan; and five licences to academic groups around the world for ONETEP, the scaling code for quantum-mechanical calculations based on density-functional theory, originating from Professor Mike Payne's team in the Cavendish Laboratory.

The Physical Sciences team has been working closely with researchers at the Nanoscience Centre to protect and commercialise their research. One area of particular interest this year has been the development of particle sensors using Micro-Electro-Mechanical Systems (MEMS) technology. These sensors can be used to detect particles including volcanic ash particles, pathogens such as asbestos and carcinogenic compounds, and common household allergens. These devices are being fabricated using eBeam lithography and nanoimprint lithography systems, technologies which are the foundations of nanoscience production.

The Physical Sciences team also works with various partners, both from within the University and from industry, to bring Cambridge technology to the market. The Cambridge Integrated Knowledge Centre (CIKC), which is funded by the Engineering & Physical Sciences Research Council (EPSRC), works in partnership with Cambridge Enterprise and industrial collaborators to commercialise University research in macromolecular materials. A focus this year has been on polymer electronics technologies from the optoelectronics group at the Cavendish Laboratory, and in particular organic photovoltaics in collaboration with the Carbon Trust, and printed transistors with Plastic Logic. The team also works with the CIKC and the Centre for Advanced Photonics and Electronics (CAPE), alongside industrial partners, on applications of liquid crystals for displays and telecommunications.

Cambridge Nanoscience Centre

The benefits of flexibility

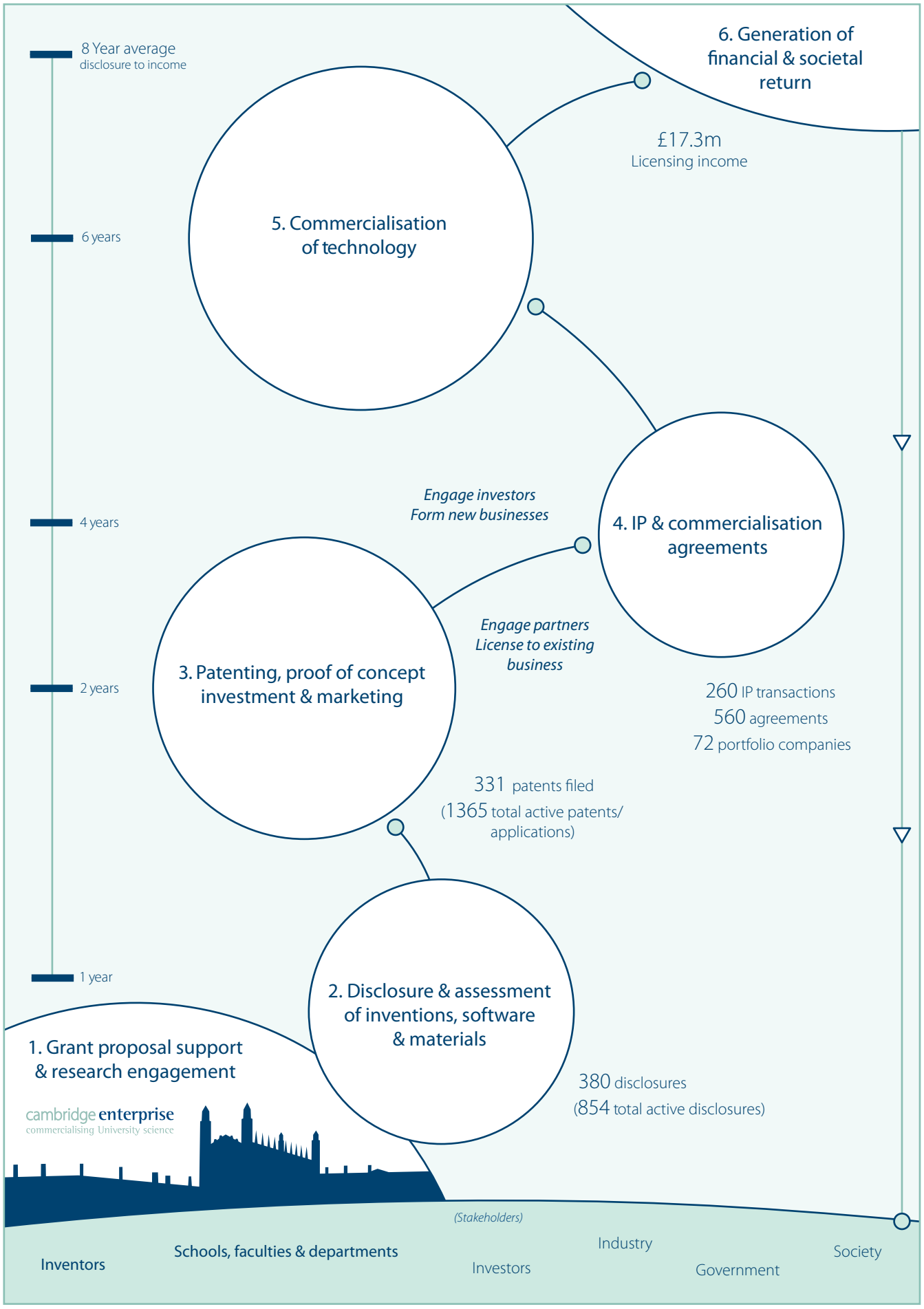
The University of Cambridge benefits from a flexible Intellectual Property policy, allowing decisions to be made and actions taken based on what will best support dissemination of the concept. This might include research collaboration, providing expert advice through paid consultancy, licensing for commercialisation, creating a new venture, publication, or a combination of some or all of the above.

The Policy, adopted by the University in December 2005, provides a clear framework that safeguards the interests of individuals, respects the rights of academics, and recognises obligations to funders of research.

Subject to any funding agreements with research sponsors, researchers may decide if they wish simply to publish or to publish and commercialise their work. If researchers do wish to commercialise, the invention is disclosed to the University through Cambridge Enterprise, which has the right to apply for registerable intellectual property rights, such as patents. Students own their intellectual property but only if they are the sole inventor and/or there is no obligation to a sponsor.

Recognising that academics have significant obligations to their teaching, research, department and College, the University's IP Policy provides incentives to participate in knowledge transfer activities with one of the most generous revenue-sharing arrangements in the world. The Policy also provides an option for inventors to commercialise their IP independently of the University, once again subject to research-funding terms.

Technology Transfer: three-year licensing performance (Aug '07 – Jul '10)



John Coates

Retirement and risk

As more and more pension schemes are closed or scaled back, individuals are being asked to take an increasingly active role in their financial planning for retirement. The public at large has a relatively low level of financial literacy, and there is a constantly widening gulf between this and the knowledge required to accurately assess the complicated credit, insurance and investment products which are available in ever-increasing numbers.

The problem faced by providers of online financial planning tools is not poorly made decisions on the part of their customers, but decisions that are not made at all. Most employees are not helped by their access to pension sites: they either fail to use the sites at all, or make poor decisions when they do use them. Various biases, so-called 'maths trauma', a widespread lack of financial literacy and labyrinthine financial websites can all lead to either poor financial decisions or decision avoidance on the part of the consumer.

The American financial services firm BlackRock requested an assessment of Target Plan, its online financial planning tool, from international consulting firm Towers Perrin (now Towers Watson) who in turn sought the advice of a group of leading Cambridge academics.

Consultancy Services contracted with Towers Perrin for the services of Dr John Coates of Judge Business School, Dr Michael Aitken of the Department of Experimental Psychology, and Professor David Spiegelhalter of the Department of Pure Mathematics and Mathematical Statistics, to consider and report on the various reasons which discourage the public from using online financial planning tools, and suggest improvements to BlackRock's Target Plan website.

Following the completion of the initial project, Towers Watson contracted with Consultancy Services for the services of Dr Coates and his colleagues to assist in the design and review process of an employee portal for BlackRock itself, to encourage its own employees to view important information more frequently.

It is hoped that the project will help to design better communications and tools to engage employees and customers, and enable them to make better-informed investment decisions.

Immediate impact from research

Consultancy is an important and effective way for the University to disseminate its knowledge and expertise to government, industry and the public sector. Through consultancy projects, cutting edge/long term University research can make a direct impact on society at the earliest stage.

The University's policy allows staff to consult through two mechanisms: either by Cambridge Enterprise assisting academics in undertaking consultancy projects through its wholly owned subsidiary, Cambridge University Technical Services Limited (CUTS), or by staff acting entirely in their personal and private capacities.

In undertaking consultancy projects through CUTS, staff are able to concentrate on the project and the relationship with the client, without the distractions or concerns about contractual matters and management of the administrative issues associated with the project. They also benefit from the University's insurance cover. CUTS provides flexible terms to ensure mutual benefit by ensuring as far as possible the projects are tailored to respect the nature and needs of both parties whilst providing confidentiality.

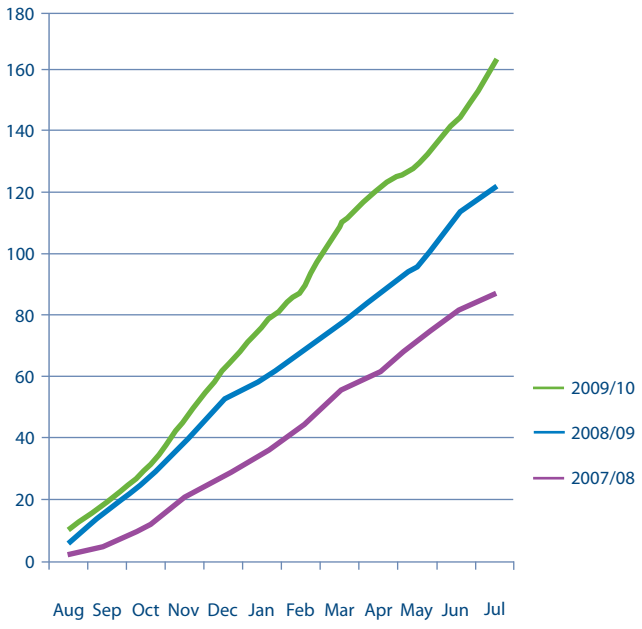
This year, the Consultancy team has worked with some of the largest and most respected companies in the UK and worldwide, including leading UK, US and European pharmaceutical companies, major petrochemical corporations and several Formula 1 racing teams.

2009/10 saw a massive increase in consultancy activity, with the number of signed agreements up 33% and the number of new agreements up 37% from 2008/09. Fully one third of this year's consultancy projects were from new academic consultants.

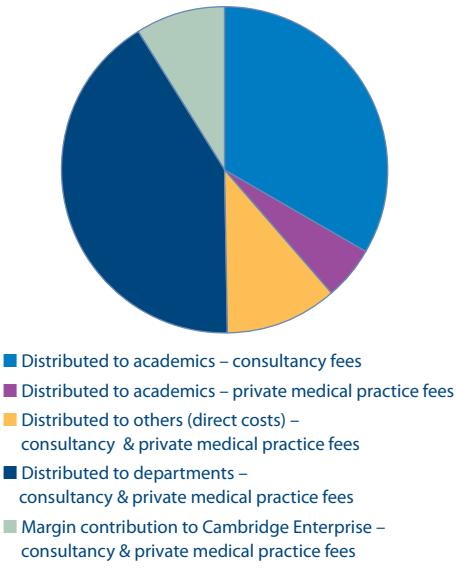
Highlights from 2009/10

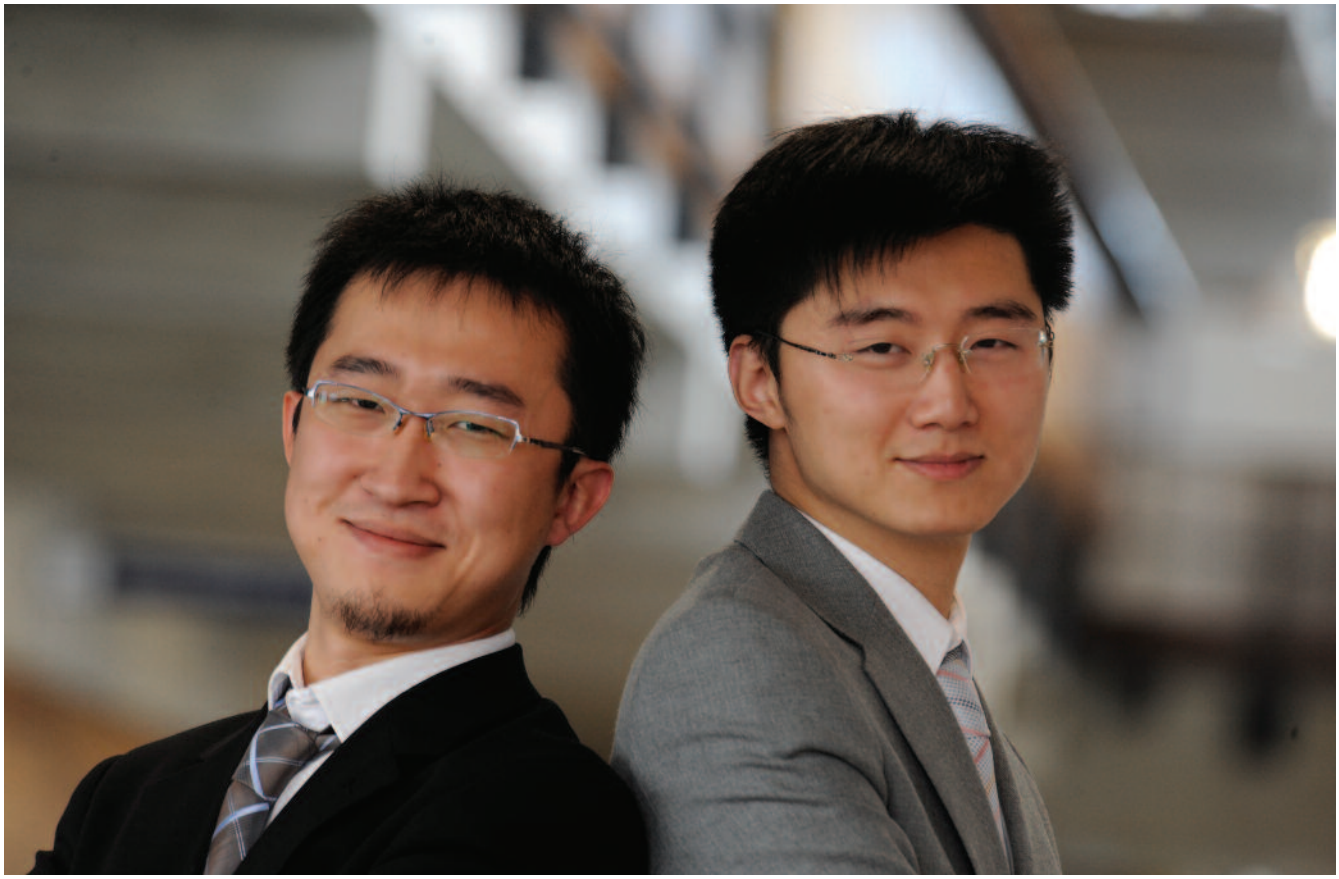
- 37% increase in new projects
- 33% increase in signed consultancy agreements
- 209 new consultancy disclosures received
- 165 consultancy agreements signed
- £2.5 million consultancy income earned
- £2.3 million of consultancy income returned to consultants and departments

Cumulative signed consultancy agreements for each of the past three financial years



Distribution of consultancy income 2009/10





Lin Sun, Yichi Zhang

Learning the lingo

Today, there are over four times as many people learning English than there are native speakers. Close to 40% of those learners are using some form of software to increase their understanding of the English language.

The problem with many of the language software products currently on the market, however, is that they fail to recognise the fact that those learning English make different grammatical errors from those made by native speakers.

Lin Sun and Yichi Zhang, two Chinese PhD students from the University's Computer Laboratory, aimed to address the shortcomings in the language software market by developing a product which addresses the specific types of errors made by non-native speakers. The two formed a company, Greedy Intelligence, and a product, named Gamma, a proof-reading and grammar-tutoring solution that specifically targets learners.

Gamma is the first software to incorporate grammar-checking technology into an adaptive learning environment that, in turn, creates a revolutionary platform for English language education.

The two approached the Seed Funds team for funding. The latter was impressed by the high standard of Greedy Intelligence's proposal and its clever solution as it enables most of the grammar checking to be done by a computer without human intervention.

With a PathFinder award from Cambridge Enterprise Seed Funds and a Proof of Market grant from the East of England Development Agency (EEDA), Greedy Intelligence is aiming to identify potential partners and customers in both the UK and China, to evaluate alternative pricing strategies and estimate early stage revenues, and to obtain a ready-to-use web interface for prototype demonstration and future use in products.

Investing in innovation

Cambridge Enterprise invests intellectual property and cash to create successful new ventures and generate impact from University research. Currently, Cambridge Enterprise holds equity in 72 companies on the University's behalf. Total realisations from the entire portfolio in 2009/10 were £1.25 million, of which £576,000 was recycled for re-investment and £674,000 was distributed in line with the University's IP policy.

Our portfolio companies[1] collectively employ close to 2,000 people, and 53% of companies reported an annual turnover, ranging from a few thousand pounds to £10 million. Together these companies have raised over £800 million in follow-on funding (including grant funding) since 1995.

The three seed funds managed by Cambridge Enterprise on behalf of the University are early stage 'evergreen' investment funds. The University Venture (£2.4 million, established in 1995) and Challenge Funds (£4 million, established in 2000), are both fully invested and the realisations are being used to support new projects. The University of Cambridge Discovery Fund (target size £5 million, established in 2008) has so far raised £1.5 million, which is also actively being invested. Since 1995, the University funds have made 55 investments, of which 52 were in new technology companies and 3 in other early stage funds.

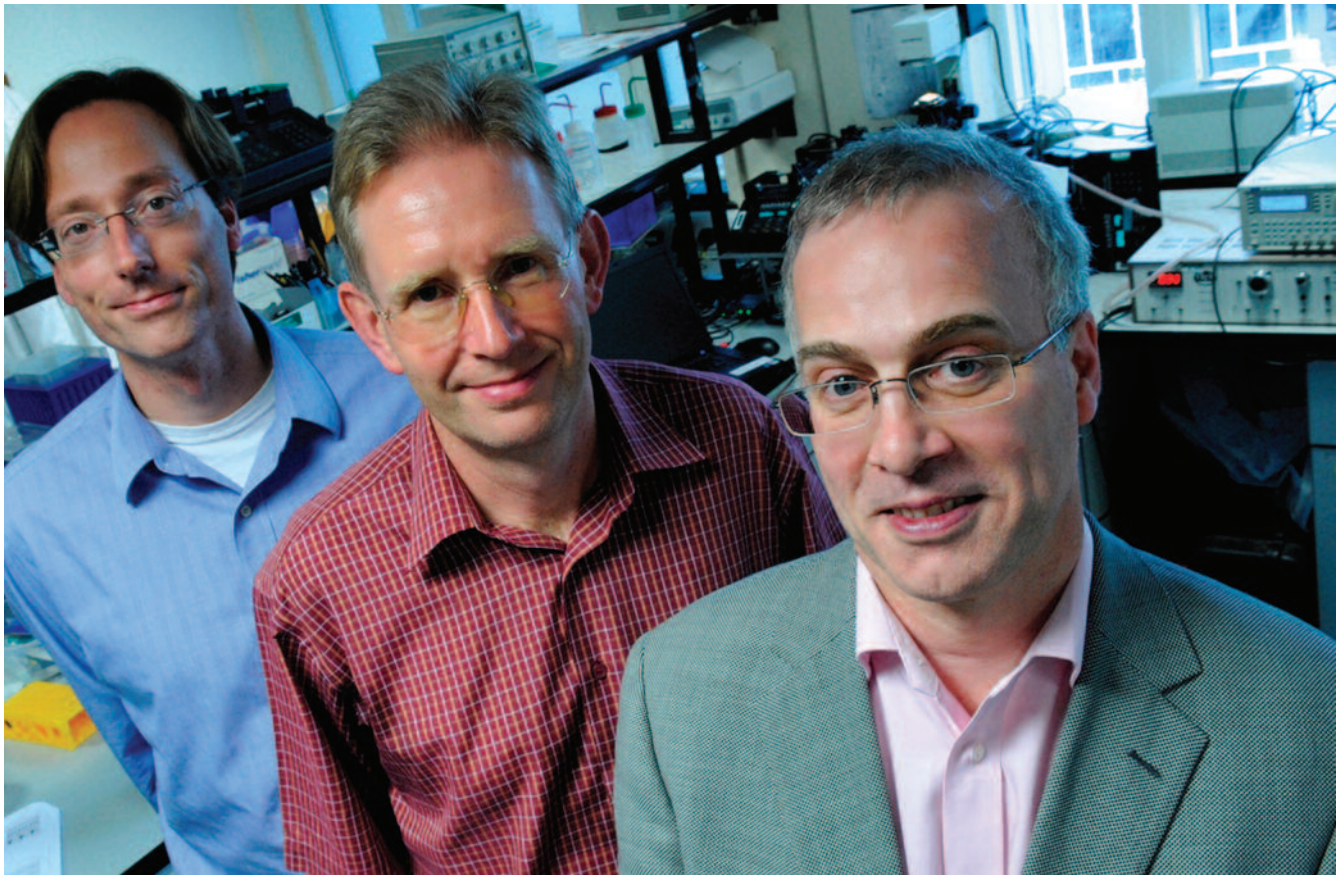
This year marked the tenth anniversary of the University's Challenge Fund, set up as part of a national government initiative to fund university innovation. Over the past decade, the University of Cambridge Challenge Fund has supported the development of 23 companies, which report raising a total of over £100 million in follow-on and £17 million in grant funding, leveraging the original University investment by 33x. Companies from all three evergreen funds[2] have raised over £600 million in grant and follow-on funding to date, leveraging the original investment by 75x.

Investment activity during 2009/10 included

- 59 business ideas reviewed
- 5 Pathfinder awards totalling £44,000 awarded to help develop new business ideas
- New and follow-on investments of £444,000 made in 6 companies
- 30 of the investee companies[2] transferred technology from the University to public or business use via product sales or licensing

In the life sciences, Orthomimetics was acquired by leading Belgian biomedical company TiGenix NV. Psynova Neurotech, founded by Professor Sabine Bahn, Director of the Cambridge Centre for Neuropsychiatric Research, developed a new blood test to aid in the early diagnosis of recent-onset schizophrenia. BlueGnome celebrated the birth of the first baby conceived using its 24sure single cell screening technology. In the Physical Sciences, CamSemi continued its impressive growth in Asia, with new offices in Korea and a new application design centre and business development office in Shenzhen, China. Amongst Cambridge Enterprise's promising new ventures is InputDynamics which was awarded a Pathfinder investment to continue the development of TouchDevice, a highly innovative product which effectively simulates a touch screen in mid-tier mobile phones.

[1] Active holdings for the entire group portfolio as of 31/07/2010.
[2] Active holdings of companies as of 31/07/10 that have received cash investment from one or more of the seed funds.



Wilhelm Huck, Chris Abell, Frank Craig

Sphere Fluidics

This year, the Discovery Fund made an investment in a new University spin-out which is developing droplets that serve as 'miniature test tubes'.

Sphere Fluidics was formed in early 2010 and aims to commercialise picolitre droplet technology to enable researchers to carry out large numbers of simultaneous reactions contained within aqueous droplets a fraction of a millilitre in volume.

Although recent advances in robotics and high-speed computers have made high-throughput screening of biological reactions feasible, these systems are still limited to the use of multi-well plates. In some cases researchers are still tied to manual measurements and procedures, limiting speed, accuracy and reliability.

While high-throughput analytical systems allow the rapid generation of thousands of experimental data points, Professors Chris Abell and Wilhelm Huck of the Department of Chemistry have developed the next generation of ultra high-throughput automated screening systems. The platform is an alternative to existing techniques and promises to increase the rate of analyses 100 fold, while improving both accuracy and reliability, offering greater control and automation, and improved efficiency.

The technology allows vast numbers of parallel experiments to be carried out simultaneously, allowing total control of the reaction environment. Droplets, each containing single molecules, cells or organisms, can be generated at a rate of tens of thousands per second. When the droplets are merged with others containing, for example, a specific chemical reagent, they act as miniature reaction chambers each one with a unique set of experimental conditions. The technology has potential uses across a wide variety of fields, including drug discovery and algal biofuel development.

Dr Frank Craig has been recruited as CEO, and the investment from the Discovery Fund will support the new company as it searches for its first clients and seeks additional funding, with the objective of being self-sustaining within 12 months. The company has recently won investment from the Royal Society Enterprise Fund and a research partnership with a top tier pharmaceutical firm.

The University of Cambridge Discovery Fund

Supporting the Cambridge 800th Anniversary Campaign – Our freedom to discover

New spin-outs play an ever more important role in actively disseminating University innovation to create real impact. Vital to the development of these new companies is the University of Cambridge Discovery Fund: a source of investment that is not afraid to take the first step; that will back long term, high risk projects; and will invest for a societal return as well as financial reward. This investment enables University innovation to bridge the funding chasm that lies between research and commercial development, launching a company that can attract smart management and follow-on investment.

The Discovery Fund was launched in 2008 as part of the Cambridge 800th Anniversary Campaign. It provides proof of concept, pre-licence, pre-seed and seed investments to new ideas with commercial value arising from University research. The Discovery Fund is a critical source of this very early investment that is so hard to find elsewhere.

Over the past year, the Discovery Fund made four PathFinder investments, and two seed investments: in Sphere Fluidics, originating from research in the Department of Chemistry; and in PneumaCare, which incorporated research developed in the Department of Engineering and has developed a novel non-contact lung monitoring device, currently in trials at Addenbrooke's Hospital.

To date, the Discovery Fund has raised £1.5 million of its £5 million goal. Realisations will be returned to the Fund in order to support future innovation, meaning that a gift to the Discovery Fund will have an impact that extends well beyond the value of the original gift and will support University innovation many times over.

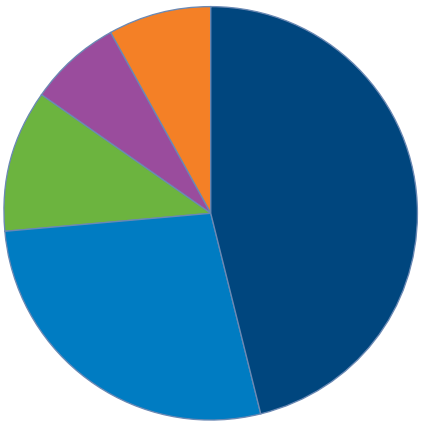
The University justifiably has an excellent reputation for starting new companies and it deserves to have the resources to match. To find out how to give to the University of Cambridge Discovery Fund please visit www.enterprise.cam.ac.uk/discoveryfund

800 YEARS TRANSFORMING TOMORROW

Financial impact from research

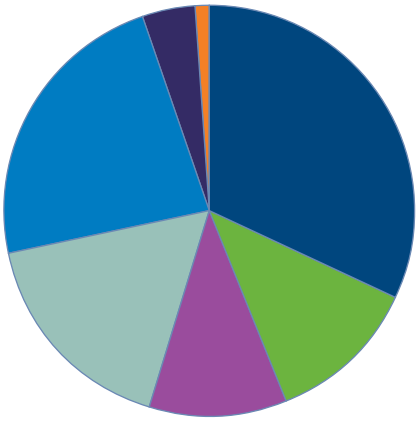
Income from knowledge transfer activities is a key indicator of the value which Cambridge research has in the marketplace. Total group income from licensing, consultancy and equity realisations in 2009/10 was £8.4 million, of which £6.6 million was or will be distributed to academics, departments and others to recognise their contributions and to encourage their further participation in knowledge transfer.

Distribution of group income 2009/10



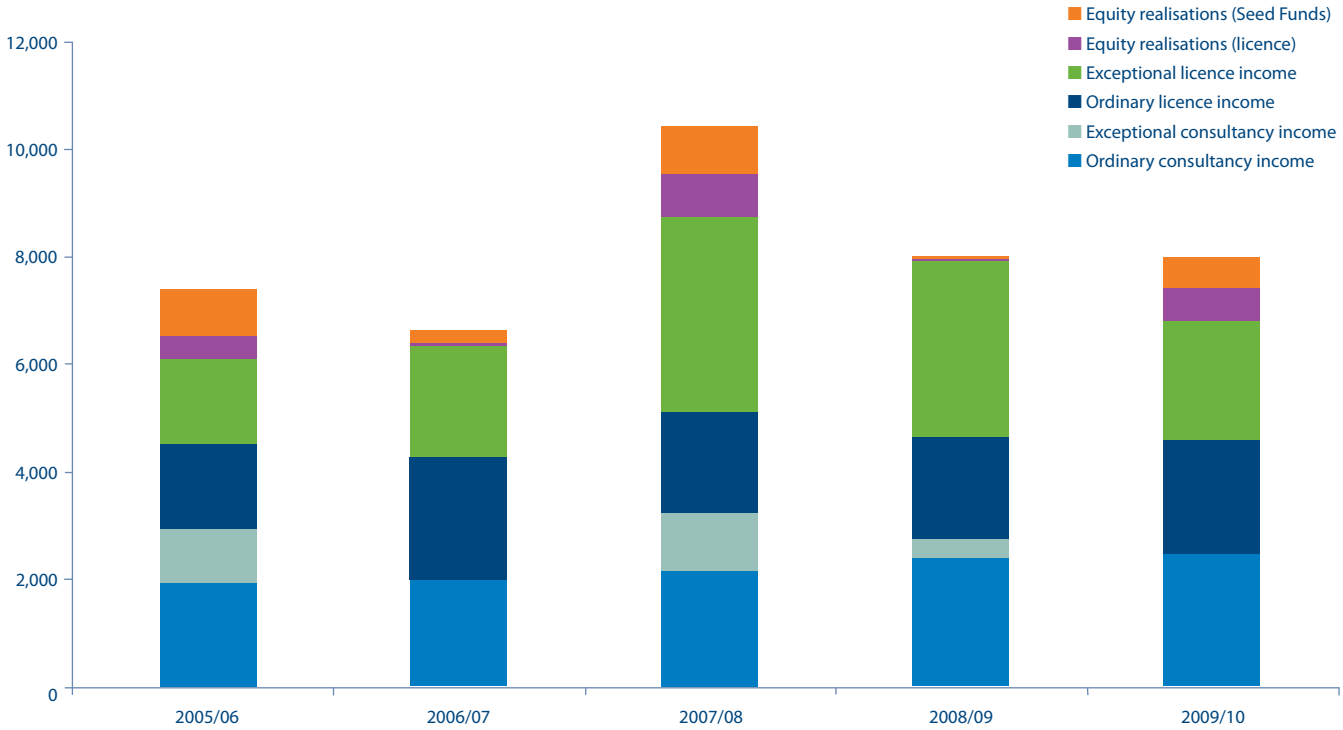
- Distributions to academics and others
- Distributions to departments
- Investment in patent assets
- Returned to Seed Funds
- Margin contribution to group

Sources for 2009/10 group operating costs (including investment in patent assets)



- Margin contribution from consultancy & licensing services – ordinary
- Margin contribution from consultancy & licensing services – exceptional
- Margin contribution from equity realisations
- Grant funding
- University funding for services
- Fees for fund management
- Other income

Group income 2005/06 – 2009/10 (£'000)



All amounts are gross

Financial performance

Group income & expenditure summary

Year to 31 July 2010

	2009/10 £'000	2008/09 £'000	2007/08 £'000
Group income:			
Income generated from activities (ordinary)	4,953	4,591	4,049
Income generated from activities (exceptional)	2,207	3,639	4,720
Seed fund and licence equity realisations[1]	1,213	160	1,650
University & HEIF funding	1,262	737	703
Fees for services	318	336	250
Other income	88	402	489
Total group income	**10,041**	**9,865**	**11,861**
Group costs, IP investment & distributions:			
Operating costs (staff costs, other costs & interest payable)	(2,589)	(2,557)	(2,478)
Investment in IP assets (patent & proof of concept)	(906)	(940)	(628)
Distributions to academics & others	(3,707)	(5,475)	(6,675)
Distributions to University departments[1,2]	(2,896)	(1,276)	(2,354)
Total group costs, investments & distributions	**(10,098)**	**(10,248)**	**(12,135)**
Net income/(expenditure) for the year	(57)	(383)	(274)

Group accounts

The group income & 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.

[1] *Seed Fund and licence equity realisations and distributions to University* include an amount received on behalf of and returned to the University evergreen funds (University Venture Fund, University Challenge Fund & University Discovery Fund) for equity realisations in the year.

[2] Distributions to University for 2009/10 includes Gift Aid and donations of £1,096,000.

Audited statutory accounts for Cambridge Enterprise Limited, Cambridge University Technical Services Limited and Challenge Fund Trading Company Limited can be found at Companies House.

Equity managed by Cambridge Enterprise

	Total £'000
Investment valuations as at 31 July 2010	13,545
Investment valuations as at 31 July 2009	10,729
Equity realisations for the year to 31 July 2010	1,213

Investments are recorded at valuation as set out in the International Private Equity and Venture Capital Guidelines (October 2006)

Governance & structure

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

Board of Directors

Chair

Edward Benthall	Charterhouse Capital Partners

Non-Executive Directors

Professor Chris Abell	Professor of Biological Chemistry, University of Cambridge
Charles Cotton	Cambridge Phenomenon Limited
Professor Sir Richard Friend	Cavendish Professor of Physics, University of Cambridge
Professor Lynn Gladden	Pro-Vice-Chancellor (Research), University of Cambridge
Dr Mike Lynch*	CEO, Autonomy plc
Professor Tony Minson	Professor of Virology, University of Cambridge
Dr Nicola Nicholls	Non-Executive Director

Executive Directors

Dr Richard Jennings	Cambridge Enterprise Limited
Teri Willey	Cambridge Enterprise Limited

Company Secretary

Registrary	University of Cambridge

Nominated Office of the Shareholder

Director of Finance	University of Cambridge

Investment Committee

John Lee	Chair
Professor Gehan Amaratunga	1966 Professor of Engineering, University of Cambridge
Charles Cotton	Cambridge Phenomenon Limited
Laurence Garrett	Highland Capital Partners LLC
Dr Hermann Hauser	Amadeus Capital Partners Limited
Derek Jones	Babraham Bioscience Technologies Limited
Dr Henry Kressel	Warburg Pincus LLC
Professor Chris Lowe	Professor of Biotechnology, University of Cambridge
Sir Keith Peters	Emeritus Regius Professor of Physic, University of Cambridge
Teri Willey	Cambridge Enterprise Limited

Senior Management Team

Teri Willey	Chief Executive
Dr Richard Jennings	Deputy Director
Dr Malcolm Grimshaw	Head of Physical Sciences
Shirley Jamieson	Head of Marketing
Mark Parsons	Head of Finance & Accounting
Dr Geraldine Rodgers	Head of Seed Funds
Dr Paul Seabright	Head of Consultancy Services
Dr Iain Thomas	Head of Life Sciences

* Joined September 2010

Looking ahead

Edward Benthall

The University's mission is to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence. Through knowledge transfer activities and innovative partnerships with business, Cambridge Enterprise plays an important role in supporting the University's mission by ensuring that basic research has a positive and sustained impact on the economy and society.

Government and other providers of research funding increasingly demand evidence that the University is delivering benefits from its research. We offer a world-class service to the University's academics, assisting them with patenting, licensing and consulting. We also provide them with very early stage funding to support spin-outs. In doing so, we support their entrepreneurial activity, we help the University generate value from its intellectual property, and we provide vivid proof that fundamental research makes a positive impact on society.

This year marks our third full financial year as a wholly owned subsidiary of the University of Cambridge. Activity continues to increase across all areas, with larger licence arrangements, a varied consultancy portfolio, and the continued success of the companies in which we hold equity.

In the face of reduced government funding, and diminishing resources for early stage investment, we must continually find new ways to support the commercialisation of research. The Discovery Fund is a key part of Cambridge Enterprise's future, and we are extremely grateful to our donors, who recognise the importance both of philanthropy and of early stage funding.

The University of Cambridge has been at the forefront of innovation throughout its history, and many of tomorrow's transformative discoveries in electronics, energy, healthcare and sustainability will no doubt be generated from here. We rely on your support to ensure these ideas become reality.

Finally, I would like to thank the team at Cambridge Enterprise for all their hard work in supporting the commercialisation of some of today's most exciting and transformative ideas.

Edward Benthall
Chairman

Equity portfolio

As at 31 July 2010

CE holdings

- Advex Corporation
- Amantys Ltd
- APOE
- Arctic DX
- Biotica Technology Ltd
- Breathing Buildings Ltd (formerly E-Stack)
- Cambivac Ltd
- Cambridge Biotransforms Ltd (formerly Pollution Technologies Ltd)
- Cambridge Flow Solutions Ltd
- Cambridge InnoVision Ltd
- Cambridge Superconductors Ltd
- Cambridge Theranostics Ltd
- Cavendish Kinetics Ltd
- CEDAR Audio Ltd
- Chroma Therapeutics Ltd
- Clinical & Biomedical Computing Ltd
- Diagnostics for the Real World
- Expedeon (formerly Novexin)
- Fibrecore Developments
- Funxional Therapeutics Ltd
- Granta Design Ltd
- Green Pb
- iLexIR Ltd
- Ionscope Ltd
- Light Blue Optics Ltd
- Microbial Technics Ltd
- Polatis Inc
- Procognia Ltd (formerly Sense Therapeutics Ltd)
- Q-Flo Ltd
- RainDance Technologies Ltd
- RevelationBio Ltd
- Sound ID
- The CRISP Consortium Ltd
- Tigenix (formerly Orthomimetics Ltd)
- Urosens
- WAX Info Ltd (formerly Cambridge Centre for Informatics Ltd)
- Zinwave Ltd

CE & CFT holdings

- Cambridge Lab on Chip Ltd
- Camfridge Ltd
- Enval Ltd
- Smart Holograms Ltd
- Vivamer Ltd

CFT holdings

- Lumora Ltd

CE, CFT & UVF holdings

- Akubio Ltd*
- Cambridge Semiconductor Ltd
- CellCentric Ltd
- Enecsys Ltd
- Metalysis Ltd
- Psynova Neurotech

CFT & UVF holdings

- Ampika Ltd
- BlueGnome Ltd
- Cambfix
- Horizon Discovery Ltd
- Inotec AMD Ltd
- Optisynx
- Sentinel Oncology Ltd
- Sure Laboratories Ltd

CE & UVF holdings

- Astex Therapeutics Ltd
- Cambridge CMOS Sensors Ltd
- Cambridge Mechatronics (formerly 1Limited)
- De Novo Pharmaceuticals Ltd
- Plastic Logic Ltd
- TeraView Ltd

UVF holdings

- Avlar BioVentures Ltd 1
- Avlar BioVentures Ltd 2
- Hypertag Ltd
- Paramata Ltd
- Phico Therapeutics (CRIL Distribution)
- Spirogen (CRIL Distribution)
- Surface Generation Ltd

CE & UDF holdings

- Sphere Fluidics Ltd

UDF holdings

- PneumaCare Ltd

CE holdings – Cambridge Enterprise Limited licence related holdings
CFT holdings – Challenge Fund Trading Limited cash related holdings
UVF holdings – University Venture Fund cash related holdings
UDF holdings – University Discovery Fund cash related holdings

*In liquidation

Company Information

Cambridge Enterprise Limited

University of Cambridge
Hauser Forum, 3 Charles Babbage Road, Cambridge CB3 0GT

Company Number: 1069886
Registered in England and Wales.
Registered Office: The Old Schools, Trinity Lane, Cambridge CB2 1TN

Cambridge University Technical Services Limited

Company Number: 5749230
Registered in England and Wales.
Registered Office: The Old Schools, Trinity Lane, Cambridge CB2 1TS

The Challenge Fund Trading Company Limited

trading as Cambridge Enterprise Seed Funds

Company Number: 3878072
Registered in England and Wales.
Registered Office: The Old Schools, Trinity Lane, Cambridge CB2 1TS

Cambridge Enterprise Limited
University of Cambridge
Hauser Forum
3 Charles Babbage Road
Cambridge CB3 0GT UK

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