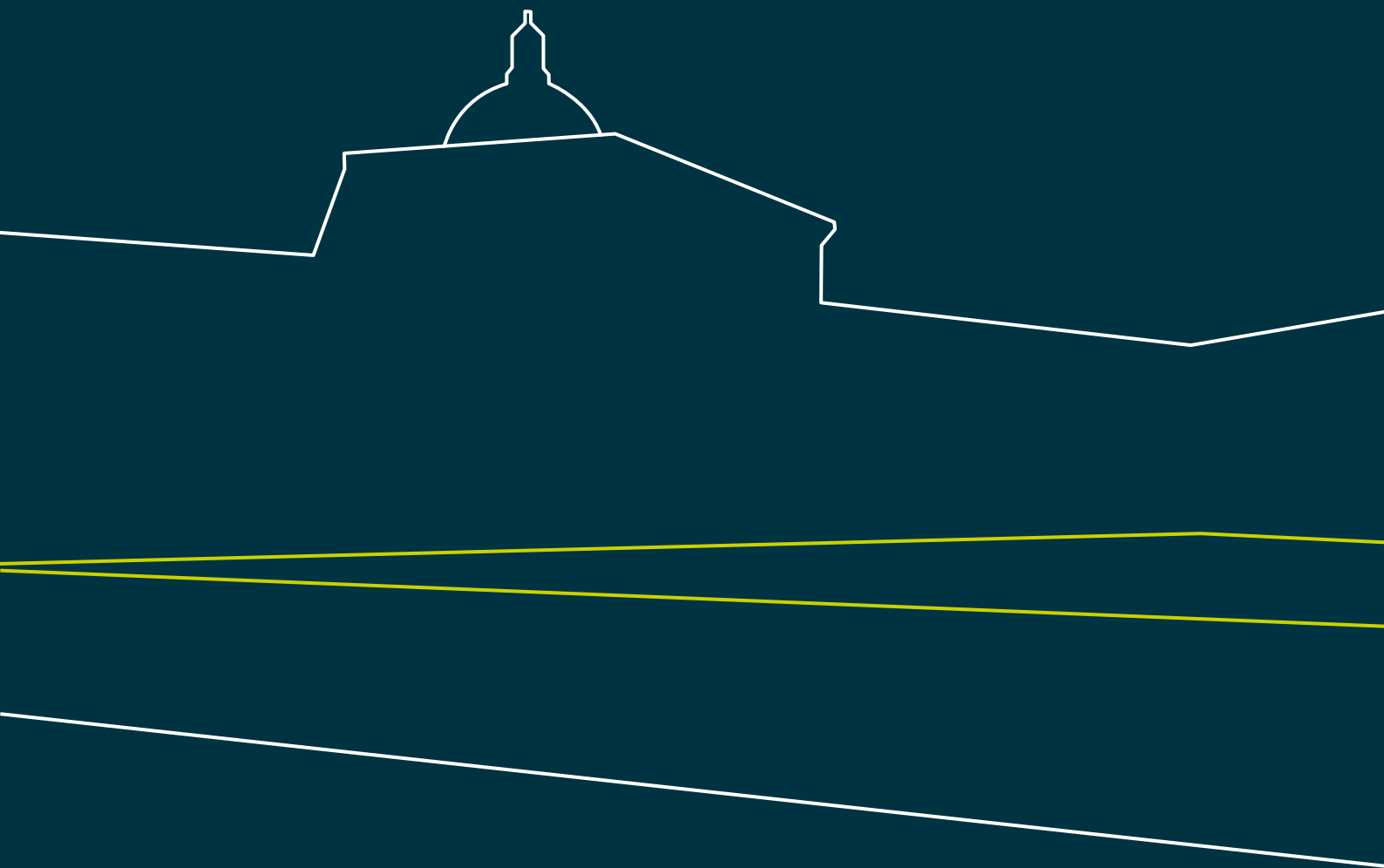


# Annual Review

## UCLB's 25th year



# 2017/18

**£25,836k**  
Turnover

**48**  
New Patent Applications

**277**  
Active Licences

**63**  
Active Spinouts

**247**  
Patent Families

**37**  
Drug Discovery Projects



# Commercialising UCL technology for 25 years

We're the technology commercialisation company of UCL and its partner NHS trusts.

As part of UCL Innovation & Enterprise, we bring to market truly world-leading, world changing innovations that have a real and positive impact on people's lives.

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**£438 million**  
investment for  
UCL gene therapy  
spinouts

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Light touch  
commercialisation  
model launched –  
Portico Ventures

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UCL's spinouts  
have raised over  
**£1 billion** in  
investment in 10  
years

**Trust us to bring  
your ideas to  
commercial life and  
share the income**

# A year of unprecedented achievement



**Dr Anne Lane**  
Managing  
Director

I am delighted to be contributing to my first UCLB Annual Review, having taken up the role of Managing Director in March 2019. This is a great time to be taking the company forward, after celebrating 25 years of successful commercialisation of UCL's technologies and 12 months of unprecedented achievement.

## 2018 was an excellent year for UCL spinouts:

**Autolus Therapeutics**, a biopharmaceutical company based on advanced cell programming technology pioneered by Dr Martin Pule (UCL Cancer Institute), made its debut on NASDAQ, raising \$160 million and now capitalised at over \$1.2bn. The company was also the biggest initial fundraiser in Europe for an SME.

**Orchard Therapeutics**, a biopharmaceutical company dedicated to transforming the lives of patients with serious and life-threatening rare diseases through autologous ex vivo gene therapies, raised \$150m in Series C funding, following \$110m in Series B in December 2017. In November it raised \$225 million through its initial public offering.

**Freeline Therapeutics**, a clinical stage company focused on treatment of chronic systemic diseases with liver targeted adeno-associated virus (AAV) gene therapy, raised £88 million in Series B funding.

We continue to evolve our approach to ensure the greatest impact; for example, we launched Portico Ventures as a pilot in June. This is run in partnership with UCL Computer Science, to test an innovative model that's already producing positive results. You can read more about it later in this review.

2018 was also the year the business was rebranded. This reflected our shared mission, as part of UCL Innovation & Enterprise, of making a positive difference to the wider world, developing leading technological innovations that have a real and beneficial impact on people's lives.

Throughout the change there's a constant: offering our academics the support they need right from the conception of an idea – which could develop into licensable intellectual property (IP) – through to the formation of a spinout company. That includes assistance for our researchers throughout the translation stage, investing through a number of different funds and offering years of experience, tradition and unique UCL know-how.

I am confident that no other university-associated tech transfer company can offer its academics our track record. Our team of experts are ready and waiting to help develop UCL's ideas into successful commercial entities today, tomorrow and for the next 25 years.

# Numbers that add up to success



**David Hunter**  
Chairman

Our 25th anniversary has proven to be quite a year for UCLB. The success of Autolus and Orchard Therapeutics, two of our spinout initial public offerings (IPOs) which now have a combined value of more than £3bn, is particularly timely and underpins our celebrations.

UCLB was also able to contribute £15m to UCL's surplus and the board had great pleasure in confirming Anne Lane's appointment as the new Managing Director, following the retirement of Cengiz Tarhan. Anne has a proven track record and experience in licensing, technology transfer and commercial strategies for early-stage technologies.

Cengiz was UCLB's MD for an impressive 25 years, right from the very beginning, when UCLB was first established in 1993. He set up the company to commercialise research from UCL for the benefit of society and he was personally involved in many of our greatest achievements, including the flotation of PolyMASC back in 1995 – the first university spinout ever to list on AIM.

On behalf of everyone here, I'd like to bid Cengiz a fond farewell, thank him for his immense contribution to UCL and UCLB, and wish him well in retirement.

Overall, we continue to move forward with 104 inventions disclosed, 48 new patents filed and 35 licence deals completed.

I hope you enjoy reading about UCLB's journey in this anniversary year. Please do not hesitate to get in touch if you'd like to know more about any aspect of our work.

# How we can help you

We're proud to be part of UCL Innovation & Enterprise, where we help turn knowledge and ideas into reality.

The extraordinary quality of the research and technologies arising from UCL's faculties and associated NHS trusts is world-renowned.

For 25 years UCLB has been providing the expert support that links the university's academics with the outside world. Our vision is 'to help support and commercialise research from UCL and NHS trusts associated with UCL for the benefit of humankind in its widest sense.'

## **Our NHS Trust partners include:**

- University College London Hospital
- Moorfields Eye Hospital
- Great Ormond Street Hospital for Children
- The Royal Free London Hospital

## **Fast forward from Freemedic**

Our forerunner, Freemedic, was launched in 1993 and was one of the very first technology transfer companies. Today we're among the leaders in the field – particularly in healthcare.

## **We deliver the complete commercialisation solution**

Our total end-to-end capability includes:

- IP protection
- Patent registration
- Creating new businesses and spinouts
- Licensing and/or sale of technologies to industry partners

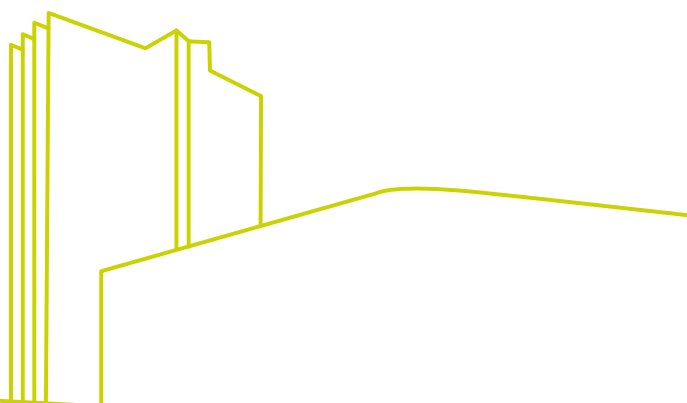
## **Fairness first**

UCLB operates differently to researchers working in the commercial world. When your business is acquired, the value of the IP is shared with you, the originator/s, and your department.

**We manage and make available to academics a number of funds to help develop ideas, including:**

**The £53m UCL Technology Fund** – supports UCL's researchers to commercialise their ideas. The fund benefits from IP commercialisation capabilities and venture capital expertise, through a close collaboration between UCLB and Albion Capital.

**Apollo Therapeutics** – a £40m fund to support drug discovery projects and drive forward therapeutic innovation, it's a unique collaboration between AstraZeneca, GlaxoSmithKline, Johnson & Johnson Innovation and the technology transfer offices of UCL, Imperial College London and the University of Cambridge.



# All the support you need, all at the right time

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## Invention disclosure

We carefully select the innovations with the best chance of commercial success and help develop and launch them.

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## Proof of concept

Transforming an idea into a proven innovation, with a performance and commercialisation potential that can be realised, takes experience, expertise and funding. We can provide you with this and more.

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## Patenting

Any IP you create with your technology is a valuable asset. Our patent team will identify the strategy that offers the best protection for it while managing the essential legal formalities.

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## Project management

You concentrate on research and development while we take care of the business, including developing commercial strategy and taking your innovation through the regulatory process. Visit our website to learn more about what our team can offer.

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## Internal and external funding

We'll find the funding that's the best fit for your project – from within UCL, the UCL Technology Fund (UCLTF), our own organisation, or other sources such as research councils and venture capitalists. Read more about the spinouts UCLTF has invested in later in the review.

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## Marketing and negotiations

We'll help identify the best exit point for your innovation, whether that be licensing, joint venture or spinout:

### Licensing

We'll find industry partners that could benefit from your innovation. We negotiate agreements and provide you with comprehensive advice and support facilities.

### Spinouts

If your technology could be better served through a new company, we'll establish, brand, fund, manage, promote and incubate it. And usually retain a stake in the new enterprise – read more about some of our latest spinout successes.

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## Social enterprise




If you are looking to develop your UCL research for public benefit – perhaps to improve the quality of life of disadvantaged people, address environmental issues or reinvest profits back into the community – we can help you develop a social enterprise. UCLB is working with academics across the university, from the UCL Great Ormond Street Institute of Child Health to the UCL e-Health Unit, in order to create solutions that can benefit society

# Our Route to Market



## Key

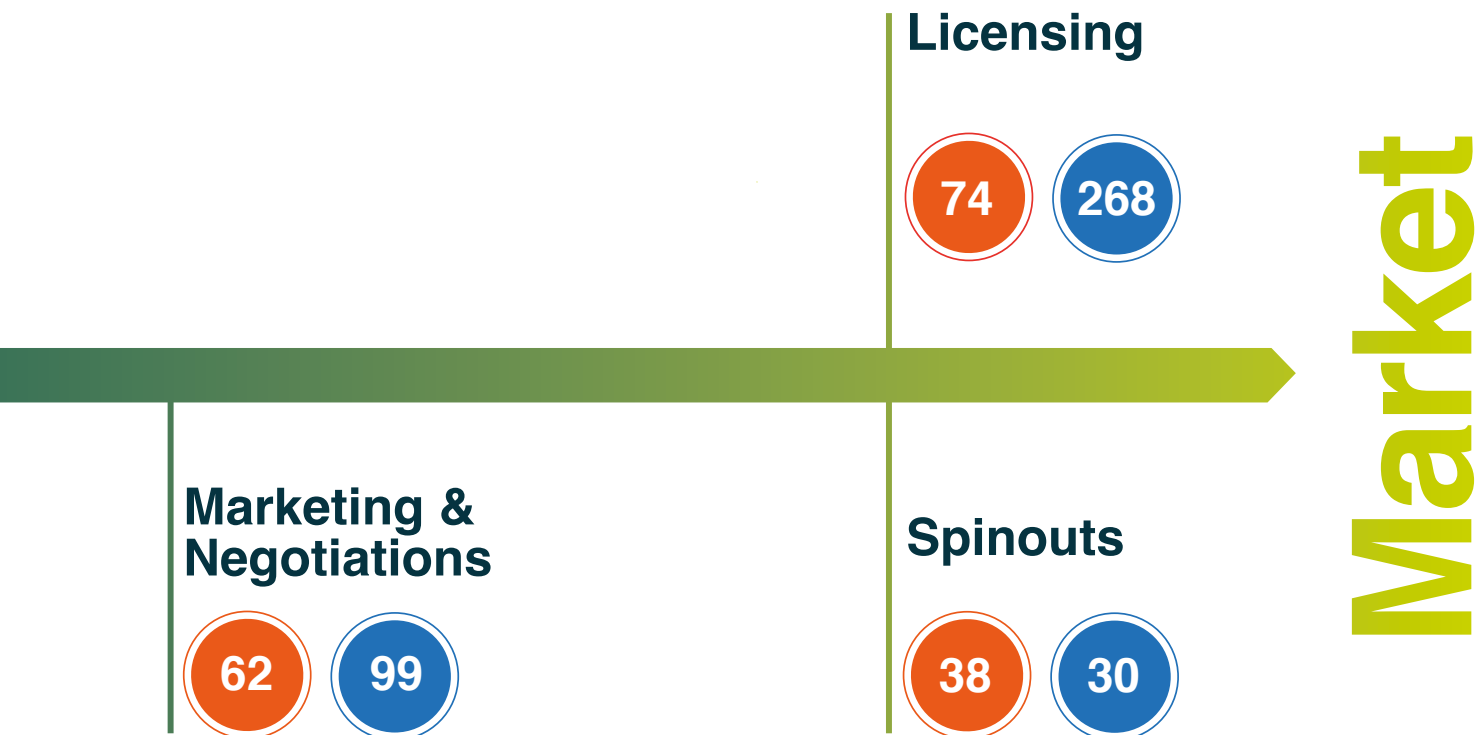
This diagram shows the total number of our active projects at each stage of the development process as of July 2018.

-  Engineering, Physical Sciences, Arts & the Built Environment
-  Biomedical Sciences
-  Project Management

See previous page for descriptions of each stage of the route to market.

\* Great Ormond Street **NHS** Hospital for Children  
NHS Foundation Trust





Moorfields Eye Hospital **NHS**  
NHS Foundation Trust

Royal Free London **NHS**  
NHS Foundation Trust

University College London Hospitals **NHS**  
NHS Foundation Trust

# Biopharmaceutical News

## Overview 2018

### Investors place their faith and funding in UCL gene therapy spinouts

It's been a record year for fundraising for a number of UCL biopharmaceutical spinouts working at the cutting edge of the gene and cell therapy space to deliver advanced therapeutics to treat a range of diseases.

During the 2017/2018 financial year, Orchard Therapeutics, Autolus Therapeutics, MeiraGTx and Freeline Therapeutics have, between them, raised in excess of \$438million (£350million). Building on what was an unprecedented year of investment, Orchard Therapeutics went on to raise a further \$375million (£300million) through a financing round and initial public offering later in the year.

#### Freeline Therapeutics

During the summer, Freeline Therapeutics, a clinical-stage company focused on treating chronic systemic diseases with a liver-targeted gene therapy developed by Professor Amit Nathwani of the UCL Cancer Institute, announced that it had raised over £88 million of new capital in Series B financing.

The funds will enable Freeline to drive its leading programs in haemophilia B and Fabry disease through clinical development, and support the progress of the pipeline.

In addition, it enables the company to further enhance its already substantial manufacturing and analytics capabilities, with the aim of delivering high quality novel products to patients.

#### Autolus Therapeutics

The business is based on the advanced T cell programming technology pioneered by Dr Martin Pule of the UCL Cancer Institute. It made its debut on the NASDAQ in June, raising \$160 million investment.

Their focus is on the development of precisely targeted, controlled and highly active T cell therapies. These offer cancer patients substantial benefits over existing standards of care, particularly in the areas of haematological cancer and solid tumours.

#### MeiraGTx Holdings

This London and New York-based clinical stage gene therapy company is focused on developing potentially curative treatments for patients living with serious diseases. In June 2018, the business raised \$75 million at the close of its initial public offering on the NASDAQ.

The company was founded by bringing together a UCLB spinout, Athena Vision, and certain assets of Kadmon Corporation LLC, a US specialty pharmaceutical company. They currently have a number of ongoing programmes. Initially focusing on diseases of the eye, salivary gland and central nervous system the MeiraGTx team believe gene therapy has the broad potential to treat a range of conditions.

## Orchard Therapeutics

In November, Orchard Therapeutics, a spinout dedicated to transforming the lives of patients with serious and life-threatening diseases through autologous (i.e. using the patient's own stem cells) ex vivo gene therapies, contributed \$225million to the annual total through its initial public offering on NASDAQ.

The capital raised builds upon three previous financing rounds, including a \$150million series C round in August of this year. The spinout, based upon research arising from the groups of Professors Bobby Gaspar and Adrian Thrasher at the UCL Great Ormond Street Institute of Child Health, also celebrated an award win in 2018. The accolade was the Global University Venturing 2018 Deal of the Year Award, for an oversubscribed \$110million series B financing round which closed in December, to which the UCL Technology Fund (UCLTF) also contributed.

Dr Anne Lane, UCLB Managing Director commented, "Over the last ten years alone, UCLB has helped the UCL community commercialise its world-leading, world-changing technologies and innovations into spinout companies that have collectively raised in excess of £1 billion investment."

Dr Celia Caulcott, UCL Vice-Provost (Enterprise) added, "The phenomenal accomplishment of raising over £430 million this year to bring new gene therapies to clinic, demonstrates the immense value of supporting each other and working collaboratively across the UCL community and partner organisations."

## Gliaalign

Hundreds of thousands of people every year are affected by severe peripheral nerve damage. This can result in paralysis and loss of sensation, often accompanied by chronic pain. Current therapies are successful in fewer than half of all cases and often require grafting of a nerve from another part of the body.

Dr James Phillips from the UCL School of Pharmacy, and his team at the UCL Centre for Nerve Engineering, have developed an allogeneic or 'off-the-shelf' cell therapy for the repair of peripheral nerve injury, called engineered neural tissue ('EngNT'). EngNT will provide a living nerve-growth guide that mimics nerve structure, and has the potential to enable both neural regeneration and functional recovery.

Established in 2018 by Dr Phillips and CEO Dr John Sinden, Gliaalign is aiming to take forward the work of the UCL academic team in engineering live neural tissue. Their current project has been funded by the UCL Technology Fund, UK Innovation and Science: Seed Fund (UKI2S) and Innovate UK.

This is a highly innovative engineering solution to an unmet clinical need. EngNT overcomes many of the limitations of nerve grafting, where healthy nerves need to be transplanted from a donor site.

## UCL Technology Fund - playing a key role

Orchard, MeiraGTx and Freeline have all benefited from investment from the UCLTF.

# Physical Sciences & Engineering News

## Overview 2018

A great year for our spinouts

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### Hazy

GDPR won't have escaped your notice. Its introduction in 2018 brought data privacy into sharp new focus.

However, the advent of data analysis as a tool – which has reached every corner of industry and research application – depends on sharing large volumes of data which may contain information subject to GDPR. Data security spinout Hazy uses advanced AI techniques to automate the anonymisation of large data sets, enabling them to be shared in a GDPR-compliant fashion. The company was the recipient of a \$1million investment from Microsoft's Venture Fund M12 and Notion, after being named the European winner of Microsoft's Innovate.AI global startup competition. A further \$1.8million of funding was raised later in 2018 in a round led by the UCL Technology Fund.

Hazy was founded just two years ago by software developers Harry Keen and James Arthur in collaboration with Dr Fintan Nagle, a machine learning scientist in UCL's Department of Cognitive, Perceptual and Brain Sciences.

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### Matrix Mill

UCL machine vision spinout Matrix Mill was acquired by Niantic Inc. in June 2018 to establish a London research base. Niantic is the developer of an advanced, large scale Augmented Reality (AR) platform and is best known for its globally popular mobile AR game Pokémon Go.

Matrix Mill was co-founded by Dr Gabriel Brostow (UCL Computer Science) with two of his team, Dr Michael Firman and Dr Daniyar Turmukhambetov, and specialises in applying deep neural network techniques (machine learning) in order to infer 3D information from images of the surrounding world. The acquisition supports Niantic in advancing its AR, computer vision and machine learning capabilities.

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### MediaGamma

Spun out by UCLB in 2014 to commercialise research developed by Professor Jun Wang in UCL Computer Science, predictive analytics software business MediaGamma received funding from the UCL Technology Fund as part of a £2m round in partnership with Park Walk Advisors and the London Co-Investment Fund (LCIF).

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### Portico Ventures

Portico Ventures is a pilot programme that aims to increase the number of UCL researchers who seek to take their research-inspired ideas to market through spinouts. Developed as a concept by UCLB with support from the Department of Computer Science and UCL Innovation & Enterprise, the programme recognises entrepreneurial aspirations within the UCL research base and the huge opportunities in digital tech which can be captured through the creation of businesses that can thrive in a fast-moving innovation ecosystem.

Portico Ventures is differentiated from traditional IP commercialisation models, as it incentivises commercially-minded researchers who wish to invest their considerable time and effort into building successful spinouts, by offering a clean intellectual property (IP) licence to non-patentable IP in exchange for a pre-agreed low percentage equity stake.

Currently being trialled in UCL Computer Science, the programme demonstrates that academic knowledge and expertise in the form of know-how, software and datasets can be translated into new ideas, algorithms or models that can transform markets, generating economic and social value. For example, Odin are using advanced computer vision and machine learning to help physicians to improve the detection and treatment of colorectal cancer during endoscopic procedures.

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## **Intrinsic**

Spun-out from the UCL Department of Electronic and Electrical Engineering by UCLB in February 2018, Intrinsic Ltd is seeking to commercialise a novel memristive RRAM device technology developed by Professor Tony Kenyon and Dr Adnan Mehonic.

Computer hardware is being pushed to manage increasing numbers of tasks at high speed, which results in significant costs in terms of energy usage and cooling requirements. Intrinsic's RRAM technology overcomes this. It is low power, fast, has excellent cycling endurance and is wholly based on silicon oxide, so it's compatible with existing semiconductor industry fabrication.

Intrinsic's devices herald an exciting range of new and disruptive technologies. The team have been supported to date on their translational journey by funds from EPSRC, UCL Business (via our Proof of Concept scheme) and the UCL Technology Fund.

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## **Endomag**

2018 has been a fantastic year for UCLB spinout Endomag, the surgical guidance company.

The company secured an £8m Series C investment round, won a prestigious British Business Innovation Award from the Institute of Physics, received the Queen's Award for Enterprise in Innovation, and gained premarket approval (PMA) from the U.S. Food and Drug Administration (FDA) for Magtrace, the first non-radioactive dual-tracer for lymphatic mapping in breast cancer patients undergoing a mastectomy.

Launched in Europe in 2013, Endomag's device has been used in over 30,000 breast cancer procedures, at 300 hospitals in 30 countries.

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## **Bramble Energy**

When it comes to renewable and sustainable energy sources, new technologies ranging from battery powered electric cars to solar arrays and wind farms have become commonplace.

Fuel cells are relative newcomers to the sustainable energy arena, but in 2018 they received a lot of attention as a source of 'green energy' with the potential to assist in decarbonising heat generation and motive power.

Founded in 2016, UCL and Imperial College London spinout Bramble Energy Ltd provides an innovative element of the emerging hydrogen energy sector. The company's patent-protected Printed Circuit Board Fuel Cell™ technology reduces the cost and complexity of the fuel cell manufacturing process. Bramble capitalizes upon joint research from the Electrochemical Innovation Lab, led by Professor Dan Brett within UCL's Department of Chemical Engineering, together with Imperial's Department of Chemistry, under the direction of Professor Anthony Kucernak.

The company is poised to play a major role in the protection of our fragile planet and to support those efforts, in 2018, Bramble raised a seed round of investment from IP Group and the UCL Technology Fund (UCLTF), which is enabling the team to leverage exciting opportunities for their technology platform in Europe and China.

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## **Senceive**

Senceive Ltd was spun out by UCLB in 2005 to commercialise an innovative wireless communications technology that had been developed in the Department of Electronic and Electrical Engineering. Fast forward 13 years, and the company is now widely recognized as Europe's leading provider of wireless Remote Condition Monitoring (RCM) solutions for the rail and geotechnical industries.

Senceive's monitoring solutions provide vital information and insights on the state of infrastructure assets, ranging from buildings and construction sites through to railway tracks and embankments, which assists in improving asset reliability and safety in a highly cost-effective and robust manner.

By acquiring asset data quickly and easily through wireless communications that can last for up to 15 years, Senceive's customers can predict the state of degradation of their infrastructure assets over many years and make appropriate and, if necessary, rapid decisions and management choices for efficient, economical and – importantly – safe operations.

This past year has been an exciting one for Senceive, with substantial growth in revenues from domestic and international markets coupled with a move to new premises in Fulham to accommodate a substantial expansion in headcount across all areas of the business. With new innovations, like the GeoWAN™ Internet of Things (IoT) wireless platform, with its long range transmission capability, and the Optical Displacement Sensor, which takes high precision displacement measurements, Senceive is well positioned to continue to lead the field in wireless enabled RCM.





# Celebrating 25 years of commercialisation

As UCLB reaches the close of its 25th year, we are celebrating some important achievements – looking back at outstanding milestones for our spinouts and looking forward to an exciting 2019 and beyond for UCL technologies.

Just one example is the recent launch of the spinout Intrinsic. This semiconductor company, based upon the research of Professor Tony Kenyon and Dr Adnan Mehonic from UCL Electronic and Electrical Engineering, shows great promise.

We also go forward into 2019 with our new brand in place, ready to take us on toward our next 25 years of commercialising the research and expertise of UCL.

We're thrilled to see some great achievements from UCL spinouts this year. The year of successes is a testament to the hard work and innovative ideas of UCL researchers and the foresight of the UCLB team in recognising commercial opportunities.

**Dr Anne Lane**  
Managing Director, UCLB.



# UCLB financial results summary

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## Income analysis for 2017/18

	£'000
Royalties and intellectual property income	7,266
Spinout exit	6,546
Fair value gain on quoted investments	7,883
Services to UCL	1,505
Research and Proof of Concept funding	1,066
Other	1,570
	<b>25,836</b>

---

## Expenditure analysis for 2017/18

	£'000
Patent Costs	1,755
Distribution to academics and external parties	4,095
Distributions to UCL	3,246
Research and consultancy	1,413
Operating costs (Staff and other costs)	4,590
	<b>15,099</b>

The above figures include the fair value gains on quoted investments and exclude the values of investments and loans impaired during the year.

The Balance Sheet is not included in this report.

Full sets of accounts are available from:

H. Rothera,  
Director of Finance,  
UCL Business PLC,  
The Network Building,  
97 Tottenham Court Road,  
London W1T 4TP

## Bring your bright idea to us

If you are a UCL academic or work for one of our partner hospitals, and have an innovation that you think might have commercial potential, please get in touch for a confidential, no obligation discussion.

We can put you in contact with one of our specialist business managers who will provide commercial advice tailored to your specific subject area. Email us **info@uclb.com** or visit our website to learn more: **uclb.com**

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