



Translating innovation

Showcasing UK entrepreneurial science

THE
ROYAL
SOCIETY

Contents

Pioneering the next generation of imaging: from pixels to perception	5
Professor Graham Finlayson	
Joining forces: smart specs to restore eyesight	6
Dr Stephen Hicks and Professor Philip Torr	
Who will save us from space storms?	9
Professor Cathryn Mitchell	
Intelligent land-use: leading the big data integration	10
Professor Mark Maslin	
Quantum security solutions: security guaranteed by the laws of physics	13
Dr Robert Young	
Greener, cheaper, more efficient: improving production through cutting-edge catalysts	14
Dr Catherine Cazin	
StarStream: tackling the challenge of antimicrobial resistance	17
Professor Timothy Leighton FEng FRS	
Getting it out there: leading the charge in the advanced materials revolution	18
Dr Krzysztof Koziol	
New standards for the future of mass spectrometry-based proteomics	21
Professor Claire Eyres	
Painkiller patches for steady, targeted pain relief	22
Professor David Haddleton	

Cover image: Professor Leighton and Dr Birkin received the Brian Mercer Award for Innovation in 2011, and partnered with Ultrawave, to develop a device from a functional laboratory technology to a user-friendly prototype called StarStream.

Foreword

The Royal Society promotes industrial science and translation and supports activities that help scientists to commercialise innovative research.

The process of translating research outcomes into commercially viable products can be challenging, involving the need to overcome many technical and non-technical barriers. The Society helps scientists on this journey by providing grants and funding, offering training and mentoring and bringing together experts in academia and industry through our meetings and conferences.

These opportunities not only give outstanding researchers the freedom to pursue excellent science, but also to benefit industry, the economy and society through the translation of research. To understand the breadth and depth of these achievements, the Society investigated the commercialisation activities of the individuals funded through its grants and fellowships since 2009.

Over this period, half of the researchers holding a Royal Society grant or fellowship have been involved in some form of commercialisation activity. Furthermore, the translation of discoveries has been steadily increasing over the past six years, with particular growth seen in the most common form of commercial activity, industry collaborations. We were also pleased to find that receipt of funding from the Society is often a key facilitator in accessing additional finance from alternative sources.

To celebrate the second year of the Society's Science and Industry programme, this booklet showcases the outstanding track record of UK scientists in research and innovation. Presented here are ten accounts of individuals who have used and built on the funding awarded by the Society to translate their research from academia to industry. We believe these scientists and the technologies they are working on are 'ones to watch' in the future.



Sir Simon Campbell CBE FMedSci FRS

Co-Chair, The Royal Society Science, Industry and Translation Committee.



Dr Herman Hauser KBE FEng FRS

Co-Chair, The Royal Society Science, Industry and Translation Committee.

“Investors like and loathe platform technologies in equal measure. They like it because there’s a lot of applications that work and there could be a lot of money to be made, but they also wonder how do you know what to choose first.”

Professor Graham Finlayson



Pioneering the next generation of imaging: from pixels to perception

Professor Graham Finlayson, University of East Anglia, former Royal Society Wolfson Research Merit Award holder.

Much information is lost when we take a photograph: the difference in brightness between pitch-black and staring into the sun is far less significant on screen or on paper than when the human eye experiences it directly; near and far objects don’t have the same level of focus or detail; colour gets lost. This is unfortunate for ‘selfies’ or holiday snaps, but becomes a big problem when looking for enemy vehicles in military satellite imaging, or when using cameras to find signs of serious illnesses.

Professor Finlayson specialises in the processing pipeline from taking a picture to seeing it on a screen. His work has improved the quality of pictures by developing programmes and algorithms to advance techniques including tone-mapping, illuminant estimation, dynamic range compression and image fusion. His work is helping to create the next generation of imaging but the ability to create more detail and depth in pictures has many potential applications – it is a platform technology, so his work does not end there.

Spinout company, Imsense, focused on digital imaging for use in mobile phones and raised £2 million in venture capital. A demo app reached top spot for photo processing in several countries, with over 100,000 downloads.

Imsense was subsequently bought by a major bluechip company from the US. It was the first spinout at UEA to raise venture capital and bring returns to the institution in its 50 year history. This helped Professor Finlayson and his industry collaborators, and also allowed UEA to build on the experience and establish better support for other commercialisation projects.

Spectral Edge, Professor Finlayson’s latest spinout, developed technology to modify images so that colourblind people are better able to see colours, with no detriment to non-colourblind people. The technology works for moving images and has been integrated into television set-top boxes.

Spectral Edge is paving the way towards ever more exciting innovations: modern cameras are able to record what the naked eye can’t see: infrared and heat. Spectral Edge uses this to create multi-layered image fusion for even clearer, more beautiful pictures.

These commercialisation activities have opened up space for Professor Finlayson to conduct further research, making new discoveries through the company. Reflecting on the challenges and opportunities of commercialisation, he concludes: “If I was advising a young academic I would say look at the medium and long term and see ‘is this going to be good for your research on those timescales?’”

Joining forces: smart specs to restore eyesight

Professor Philip Torr, University of Oxford/Oxford Brookes University, former Royal Society Wolfson Research Merit Award holder.

Dr Stephen Hicks, University of Oxford, received the Brian Mercer Award for Innovation.

Sometimes it's the combination of two very different fields of science that leads to successful commercialisation. Dr Hicks is a clinical specialist on the neuroscience of vision who collaborates with Oxford Eye Hospital, to research how much sight people have and ways to increase it, including through using wearable devices. Professor Torr is an expert in computer vision and learning – how to make computers recognise what they see. Looking to apply his research to help the partially sighted, he found Dr Hicks through a simple internet search for experts in the area.

The potential in combining their expertise to create intelligent wearables to increase what partially sighted people can see was evident from the start. Dr Hicks notes: “As researchers you always say ‘We should join forces and do some work together’, so it’s great when someone actually funds that.”

Through Dr Hicks’ Brian Mercer Award for Innovation and Professor Torr’s Wolfson Research Merit Award, they developed a ‘smart specs’ prototype: a 3D camera and Android powered computer program that enhances the visibility of nearby objects. Software hides the background and highlights edges and features to make objects easier to see. Many of these features work in darkness and the video can be paused or zoomed to provide greater detail.

360,000 people in the UK are registered as blind or partially sighted.¹ Trials have shown that the smart specs work for 30% of those. But Professor Torr and Dr Hicks understand well that they are addressing a global problem and have the opportunity to help many of the estimated 285 million visually impaired people in the world.²

No larger company did anything comparable, so they founded Oxford University spinout company VA-ST to commercialise the smart specs. The company has global ambitions, with China, the US and northern Europe planned as target markets. Mindful of the need for continuous development, Dr Hicks explains the way forward:

“The plan is to build several successive models that become smaller, more powerful and less expensive. The system we have right now works very well. If, however, it turns out to be too unwieldy, we’ll do some more engineering, but right now we have a fully functional product.”

An application to the Google impact challenge in 2014 won £0.5 million to test prototypes developed during the Brian Mercer award in everyday use. The company has also raised £2 million from a private investor in China, and will officially launch worldwide in early 2016.

“As researchers you always say ‘We should join forces and do some work together’, so it’s great when someone actually funds that.”

Dr Stephen Hicks



1. <http://www.rnib.org.uk/sites/default/files/Sight%20loss%20stats%20postcard.pdf> (accessed 15 February 2016)

2. <http://www.who.int/mediacentre/factsheets/fs282/en/> (accessed 15 February 2016)

“The Imperial College Business School training courses offered to me by the Royal Society really inspired me to look for opportunities to commercialise my research.”

Professor Cathryn Mitchell



Who will save us from space storms?

Professor Cathryn Mitchell, University of Bath, former Royal Society Wolfson Research Merit Award holder.

Severe space weather, caused by geomagnetic disturbances in Earth's upper atmosphere, is one of the highest priority natural hazards affecting many critical national infrastructures from transportation and communication to electricity and defence. According to a recent report by Lloyd's, the total economic cost of an extended power outage for a major solar storm in North America could be as much as \$2.6 trillion.³

Professor Mitchell's research in data assimilation and tomography is helping to understand what causes solar storms and how to forecast space weather. The unique 4D algorithms she has developed (collectively known as MIDAS, Multi-Instrument Data Analysis Systems) ingest satellite and ground-based data to provide accurate, real-time information about space weather events and their impact on satellite systems like GPS. Professor Mitchell's team build and operate their own equipment to provide data for MIDAS at sites as remote as Antarctica.

The integration of such powerful software with other public information systems and commercial hardware is becoming a reality. A £4.6 million investment by the UK government is being used to equip the Met Office with the capability to provide space weather forecasts and other critical information, using the ionosphere algorithms within MIDAS.

The data, algorithms, and space weather scenarios generated by MIDAS have also contributed a new space-weather feature to a GPS hardware simulator by global leader Spirent. MIDAS has also contributed to the successful development of Interference Detection Monitors by Chronos Technology, a UK SME specialising in GPS products and services. This new device is now part of the SENTINEL system, which enables the protection of critical national infrastructure from GPS interference.

There is a strong commercial push worldwide to use cheap and robust GPS systems in a global space economy that reached \$330 billion in 2014.⁴ Professor Mitchell is working with colleagues on a sophisticated, physics-based model to help the global satellite and communications industry forecast space-weather effects. Existing technologies can only do this up to two hours in advance, which Professor Mitchell's team hopes to increase to 12 hours and hence provide an early warning system. Many commercial companies requiring high accuracy positioning and reliable long-distance communication systems will no doubt be keen to take up the new technology.

3. https://www.lloyds.com/~media/lloyds/reports/360/360%20space%20weather/7311_lloyds_360_space%20weather_03.pdf (accessed 15 February 2016)

4. <http://www.spacefoundation.org/media/press-releases/space-foundation-report-reveals-global-space-economy-climb-330-billion> (accessed 15 February 2016)

Intelligent land-use: leading the big data integration

Professor Mark Maslin, University College London, Industry Fellow.

The big data revolution has given us huge amounts of new information to help individuals, companies and governments make better sense of the world. But there is a problem with these masses of new information: different organisations collect data in different ways. Professor Maslin explains: “Everybody produces beautiful spatial data: health professionals, climatologists, agriculturalists, even economists. But they are all in different data formats and coordinate systems, so place A in one person’s data is not place A in someone else’s data.”

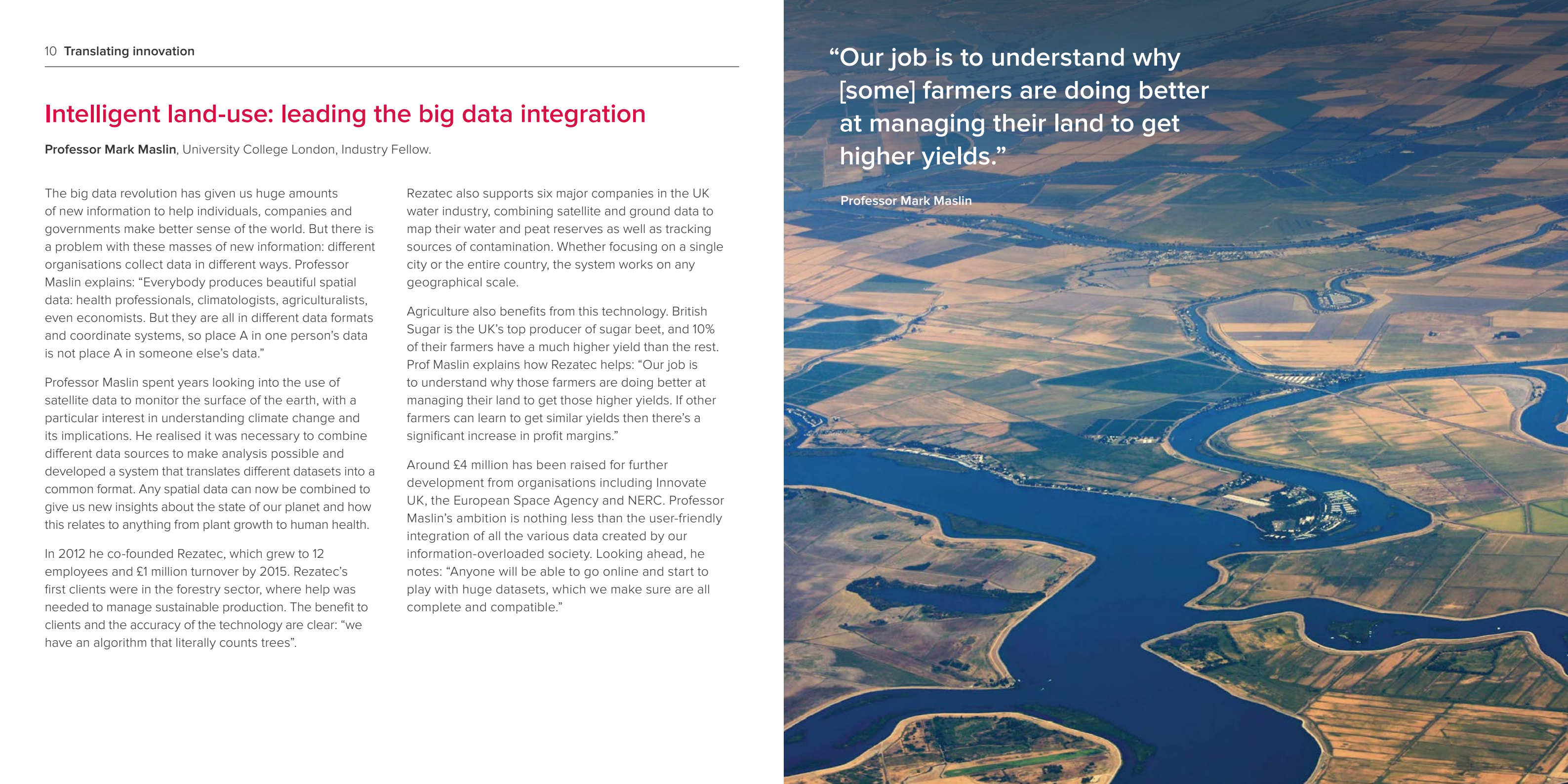
Professor Maslin spent years looking into the use of satellite data to monitor the surface of the earth, with a particular interest in understanding climate change and its implications. He realised it was necessary to combine different data sources to make analysis possible and developed a system that translates different datasets into a common format. Any spatial data can now be combined to give us new insights about the state of our planet and how this relates to anything from plant growth to human health.

In 2012 he co-founded Rezatec, which grew to 12 employees and £1 million turnover by 2015. Rezatec’s first clients were in the forestry sector, where help was needed to manage sustainable production. The benefit to clients and the accuracy of the technology are clear: “we have an algorithm that literally counts trees”.

Rezatec also supports six major companies in the UK water industry, combining satellite and ground data to map their water and peat reserves as well as tracking sources of contamination. Whether focusing on a single city or the entire country, the system works on any geographical scale.

Agriculture also benefits from this technology. British Sugar is the UK’s top producer of sugar beet, and 10% of their farmers have a much higher yield than the rest. Prof Maslin explains how Rezatec helps: “Our job is to understand why those farmers are doing better at managing their land to get those higher yields. If other farmers can learn to get similar yields then there’s a significant increase in profit margins.”

Around £4 million has been raised for further development from organisations including Innovate UK, the European Space Agency and NERC. Professor Maslin’s ambition is nothing less than the user-friendly integration of all the various data created by our information-overloaded society. Looking ahead, he notes: “Anyone will be able to go online and start to play with huge datasets, which we make sure are all complete and compatible.”



“Our job is to understand why [some] farmers are doing better at managing their land to get higher yields.”

Professor Mark Maslin

“We want to provide the brains and ideas and show electronics companies how to use our technology and then innovate with it.”

Dr Robert Young

Quantum security solutions: security guaranteed by the laws of physics

Dr Robert Young, Lancaster University, University Research Fellow.

Our growing reliance on information systems for day-to-day activities and the increased volume and sophistication of cyber-attacks make us vulnerable to crimes such as fraud, identity theft and counterfeiting. Currently available cybersecurity solutions rely on mathematics and are not completely secure. However, Dr Young, founder of the Lancaster-based start-up Quantum Base,⁵ is using the basic rules of quantum physics to build more secure solutions for the future.

The idea is not new: several companies already offer Quantum Security solutions, but they are extremely expensive and very bulky. Dr Young and his team are working towards a much smaller and cheaper version – about 1 cubic micrometre in size and costing around £1 rather than £100,000.

The secure communications link will be based on single photonic circuits, which could function as both the transmitter and receiver of the quantum security system, and will allow integration into embedded systems. A fully functional prototype is still two years away but Dr Young predicts that once available it will be able to detect any interceptions of communications with complete accuracy.

Meanwhile, Quantum Base is already marketing the world’s first Quantum Physically Unclonable Functions (PUFs) or Q-IDs – nanoscale devices that deliver an extremely high level of authentication. These devices can be used for any application requiring electronic ID verification, for example in SIM cards, Chip and PIN devices, and HDMI cables. An optical version is also available that can be used instead of holograms and QR codes, which are becoming increasingly easy to clone. For instance, pharmaceutical companies can combat counterfeiting by labelling individual tablets with unique optical Q-IDs, which can be authenticated against a database. In this way, Q-IDs could have wide ranging societal and economic impact in the future.

Quantum Base is currently valued at around £3 million, has attracted investors and is negotiating its first licensing agreement. The company has benefitted greatly from the involvement of co-founder Phillip Speed, a serial entrepreneur with over 25 years of experience in the ICT industry, and a diverse board of non-executive directors with vast experience in the corporate world. Long term, Quantum Base’s aim is to continue to develop new technology and license it to electronics companies, who can then use it to innovate. With the new game-changing technology just around the corner, the company is expected to grow exponentially in the near future.

5. www.quantumbase.com (accessed 15 February 2016)

Greener, cheaper, more efficient: improving production through cutting-edge catalysts

Dr Catherine Cazin, University of St Andrews, University Research Fellow.

From pharmaceuticals to fragrances, dyes to agro-chemicals, many products require catalysts in their manufacture. Many catalysts are expensive, require large quantities and high temperatures to work properly, and leave toxic residues in the final product. The result is inefficient production and higher costs for producers and consumers.

Dr Cazin specialises in the discovery of new catalysts that need less energy to activate, are greener and generate less waste and residue.

One of her catalysts - based on the metal ruthenium (Ru) - activates a reaction widely used in the manufacture of pharmaceuticals. For health and safety reasons, there are strict rules on how much metal catalyst residue is allowed in the end product, making additional cleaning and purification necessary. But this step might no longer be required, as Dr Cazin explains:

“It is extremely important to develop very active catalysts that lead to metal contamination that follow regulatory guidelines. We invent catalysts for pharma that are active at ppm levels and make costly purification and metal retrieval unnecessary.”

The same catalyst was also shown to be exceptionally useful in several industrial applications, especially for producing body panels of vehicles. It was quickly licenced for production and is now commercially available through chemicals giants such as Umicore, Aldrich and Strem Chemicals.

Industry has great interest in obtaining alternative products in the supply chain, and large multinationals such as AstraZeneca and Syngenta support Dr Cazin's research through industrial CASE (Cooperative Awards in Science and Technology) studentships. This initiative offers an excellent opportunity for industry to learn about the latest academic research while training the next generation of industrial researchers.

In the future, Dr Cazin plans to continue her cutting edge research into industrial catalysts. She has been recognised as a Rising Star Speaker in the 41st International Conference on Coordination Chemistry in Singapore and through the Sir Thomas Makdougall Brisbane Medal (Royal Society of Edinburgh) in 2014.



“We invent catalysts for pharma that are active at ppm levels and make costly purification and metal retrieval unnecessary.”

Dr Catherine Cazin

StarStream: tackling the challenge of antimicrobial resistance

Professor Tim Leighton FEng FRS, University of Southampton, received the Brian Mercer Award for Innovation.

“We have given out £150,000 of funds to replicate the multidisciplinary team we had in the Brian Mercer award – we have done that for 12 other teams and have calls out to double that.”

Professor Tim Leighton

Antimicrobial resistance (AMR) is an increasingly serious threat to global public health that requires action across all government sectors and society.⁶ The threat of a post-antibiotic age⁷ means that new ways of cleaning and sanitising at the microbial level will become important. But Professor Leighton cautions against using only chemical approaches to this problem: “microbe populations can become resistant because we leave ‘smoking guns’ in our water run-off, giving clues as to what killed the previous bugs. These ‘clues’ in sub-therapeutic concentrations might assist the vast reservoirs of microbes in our water and sewage systems to develop resistance”

Professor Leighton specialises in ultrasonics, underwater acoustics and engineering, and is interested in the environmental applications of this work. Enhancing the cleaning properties of water by infusing it with sound waves, he and his colleague, Dr Peter Birkin, built a laboratory device capable of cleaning at the microbial level, with low usage of cold water and without any chemical additives. The key to the technology is to infuse a trickle of cold water with microscopic bubbles and particular frequencies of sound.

Professor Leighton and Dr Birkin received the Brian Mercer Award for Innovation in 2011, and partnered with Ultrawave to develop the device from a functional laboratory technology to a user-friendly prototype – StarStream. In parallel, Professor Leighton’s research team tested its

cleaning capability in three areas: removal of dental bacteria, removal of soft tissue from pre-transplant bones, and removal of CJD contamination from surgical instruments.

StarStream is an especially important innovation in the fight against AMR. Professor Leighton explains: “StarStream doesn’t leave a trace of anything in the water supply. There are no chemicals to tell the bugs what was used to kill their predecessors.” Extensive testing and further product development conducted through the award has brought the technology close to commercialisation: Ultrawave aims to bring StarStream to the market as a generic cleaning device in early 2016, while Professor Leighton’s team will co-develop subsequent versions for more specific application in the biomedical sector.

The interdisciplinary team that developed StarStream has formed the basis for a strategic research group on AMR at the University of Southampton (Network for Anti-Microbial Resistance and Infection Prevention – NAMRIP), which secured first £50,000 of university funding, followed by an additional £868,000 through the EPSRC.⁸ NAMRIP now funds other research and commercialisation activities aimed at tackling the growing challenge of AMR. These include collaborations, one with IBM to develop cognitive computing to assist tackling AMR, and commercial projects to increase the efficiency of AMR diagnostics.

6. <http://www.who.int/mediacentre/factsheets/fs194/en/> (accessed 15 February 2016)

7. http://apps.who.int/iris/bitstream/10665/112642/1/9789241564748_eng.pdf (accessed 15 February 2016)

8. <http://www.southampton.ac.uk/namrip/news/2015/03/epsrclidwin.page> (accessed 15 February 2016)

Getting it out there: leading the charge in the advanced materials revolution

Dr Krzysztof Koziol, University of Cambridge, former University Research Fellow.

When it comes to research findings, Dr Koziol is clear about his ultimate intentions: to get the research out of the lab and into the real world, for individuals and companies to use.

With a background in chemistry and material science, he specialised in carbon-based nanotubes and in developing the production of graphene – one of the most promising advanced materials of our time. These materials can be used for many applications: ultralight cables and components can reduce weight and energy consumption of aircraft and vehicles; graphene can be used for many types of intelligent surfaces, including ultra-thin heating devices or automatic damage reporting.

Dr Koziol explains that it's not just excellent science that industry needs – stepping beyond a single science problem and towards integrated systems is key: "Most people just target one thing, but I wanted us to move forward with big steps and on a really large scale. Sometimes a number of problems must be solved: in our power distribution systems you need new connectors, you need better insulation and some other developments as well, in order to make it a reality."

This integrated thinking has led Dr Koziol to starting eight spinout companies so far. He also heads 'Ultrawire' a €3.3 million EU development consortium with industry partners including National Grid, Peugeot-Citroen and some of the world's largest cable manufacturers. He has a leading role in the integration of old copper conductors with advanced materials to create lighter, more efficient alternatives.

As founder and executive director of Cambridge Nanosystems (CNS), his most fruitful spinout to date, Dr Koziol advises businesses on how to make use of advanced materials. But the company does not only consult: in 2013 CNS acquired Norwegian company GasPlas, whose plasma-based technology enabled cleaner, faster production of graphene using natural gas. This makes Dr Koziol's company one of the largest producers of graphene in the world with a current production capacity of five tonnes per year. Additional facilities are underway to produce thousands of tonnes of high performance graphene.

CNS works with industries ranging from automotive and aerospace to power supply and construction so Dr Koziol understands the importance of engaging with their needs: "people don't just say, 'can I have a tonne of graphene?' They say, 'how do I improve my business and existing products with this new material?'"

"The Royal Society fellowship was just a phenomenal platform, which enabled all this, to let me think freely and do my plans."

Dr Krzysztof Koziol



“Commercialisation can be a pragmatic choice for academic researchers who wish to make their technology or products available for wider use.”

Professor Claire Eyers



New standards for the future of mass spectrometry-based proteomics

Professor Claire Eyers, University of Liverpool, former Dorothy Hodgkin Fellow.

Analysing proteins is a critical tool in many areas, including drug discovery and diagnostics. In diseases such as cancer and heart disease specific proteins may be modified or present in unusual amounts and so identifying these proteins can help in diagnosis or developing novel treatments. This can be achieved through mass spectrometry, a cost-effective technique for quantitatively analysing a large number of proteins simultaneously.

To work properly, mass spectrometers and the associated technique of liquid chromatography, need to be calibrated using robust standards to allow changes the quantity or structure of proteins to be accurately measured. With better standards, mass spectrometry can be used to greater effect and be capable of better analysing ever more complex challenges.

Professor Claire Eyers and her team have developed three reference standards, allowing labs to enhance the accuracy of their mass spectrometry-based measurements. Importantly, unlike other standards, these have been specifically designed to allow standardisation across different laboratories and instrument platforms, which means that different labs can reproduce results more easily.

These standards are fulfilling the needs of both the research community and clinicians, since protein analysis can be applied in a variety of areas including

personalised medicine, clinical analysis, diagnostics, drug discovery, toxicology, food safety and quality control. Moreover, with the global proteomics market predicted to grow to over \$20 billion by 2018,⁹ these standards are of great commercial value.

Two of the standards (QCAL and QCAL-IM) are already available commercially, with the third (RePLICal) due to be launched imminently. PolyQuant GmbH, a company specialising in quantitative proteomics solutions, manages the sales.

This commercialisation effort was a pragmatic choice for Professor Eyers, as academic, industrial and clinical researchers all benefit from more effective and widely applicable standards in mass spectrometry. She explains: “A research lab does not have the necessary infrastructure for production and distribution. Besides, we wanted our standards to be widely available, so licensing our technology and products to PolyQuant was the logical choice.”

Professor Eyers’ new venture is a bioanalysis company with colleagues Dr Hannah Roberts, Professor Sabine Flitsch and Professor Perdita Barran. Bio-Shape, registered in November 2015, will be providing protein and glycan structural analysis services to companies, and is the focus of her commercial efforts.

9. <http://www.marketsandmarkets.com/PressReleases/proteomics.asp> (accessed 15 February 2016)

Painkiller patches for steady, targeted pain relief

Professor David Haddleton, The University of Warwick, former Royal Society Wolfson Research Merit Award holder.

Professor Haddleton first started to collaborate with companies over 20 years ago, using his expertise in polymer chemistry for industrial partners to provide solutions to their real world problems. Over the years, he has been involved in developing new deodorants and hair straightening treatments for Unilever, developing ways to deliver insecticides to crops for Syngenta and producing high-performance automotive lubricants for Lubrizol.

With his latest spinout company, Medherant, he is expanding his horizons to transdermal delivery of drugs through adhesive skin patches. The first patented product from this endeavour covers an ibuprofen patch that delivers a steady dose for up to 12 hours. This is a world first since many currently available over-the-counter pain-relieving patches are heat-generating pads that often contain no active ingredient. Plus, ibuprofen patches are potentially beneficial for patients suffering from conditions like chronic pain, neuralgia and arthritis because they offer high dose, rapid and targeted pain relief without the usual adverse effects from the continued use of oral ibuprofen.

The patches are made by dissolving the drug – up to 30% of the weight of the patch – in an adhesive polymer licensed from Bostik, a leading provider of specialist adhesive. Patches are also being developed for other

common painkillers including lidocaine, diclofenac and methyl salicylate. Since the patches are easy to make and are able to contain large amounts of active ingredient, they could also be used for transdermal delivery of prescription drugs as well, even to treat illnesses such as cancer and Alzheimer's disease. The goal is to "have a suite of different transdermal products." Professor Haddleton adds:

"We know there is a market out there for our patches. A recent poll in the Metro showed that 96% of people would use a painkiller patch over a pill.¹⁰ Big pharma are also interested and as of now, we are in talks for co-developing products with five of the top ten global pharmaceutical companies."

Founded in 2014, Medherant was supported in the early stage of its development by Warwick Ventures, the University of Warwick's commercialisation arm. The company has since secured over £400,000 in seed funding from one of the UK's leading technology investors, Mercia Fund Management, and business angels. In the next two years, the company hopes to expand its workforce from five to 20 employees and bring the ibuprofen patch on the market. With the global market for transdermal delivery of drugs predicted to reach \$31.5 billion by 2015,¹¹ the future is promising.

"We know there is a market out there for our patches. A recent poll in the Metro showed that 96% of people would use a painkiller patch over a pill."

Professor David Haddleton



10. <http://metro.co.uk/2015/12/10/well-soon-be-able-to-use-painkiller-patches-5556019/> (accessed 15 February 2016)

11. Transdermal Medicine Review and Outlook, PharmaLive Special Report Sep 2011 (accessed 15 February 2016)



The Royal Society is a self-governing Fellowship of many of the world's most distinguished scientists drawn from all areas of science, engineering, and medicine. The Society's fundamental purpose, as it has been since its foundation in 1660, is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity.

The Society's strategic priorities emphasise its commitment to the highest quality science, to curiosity-driven research, and to the development and use of science for the benefit of society.

These priorities are:

- Promoting science and its benefits
- Recognising excellence in science
- Supporting outstanding science
- Providing scientific advice for policy
- Fostering international and global cooperation
- Education and public engagement

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Registered Charity No 207043

Issued: February 2016 DES4113