UNIVERSITY OF BIRMINGHAM

think
Business with Birmingham
issue one

Discover tomorrow's technologies today

Climate change enhanced by human activity over the past 300 years is now an internationally critical political, social and economic issue.

Developed and developing countries urgently need to reduce the amount of greenhouse gases (GHG) they emit and to take measures to adapt to climate change impacts as a result of the GHG that are already in the atmosphere. The UK has taken a global lead on this issue through the UK Climate Change Act and is committed to an 80% reduction in GHG emissions by 2050 (Source DEFRA). See page 4

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Business *with* Birmingham

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University of Birmingham spin-out, pharmaceutical company Celentyx Ltd, go from strength to strength

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Progressing to a low carbon society
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think health

University of Birmingham spin-out company, Celentyx Ltd

Celentyx founders John Gordon and Nicholas Barnes with MP Gisela Stuart

University of Birmingham spin-out companies

Learn more
www.alta.bham.ac.uk

The University provides a launch-pad for innovative spin-out businesses. Pharmaceutical company Celentyx Ltd, for example, develops treatments for serious common diseases by finding new uses for existing drugs.

The idea for the company sprang from a conversation between Professor Nicholas Barnes and Professor John Gordon, who questioned whether drugs used for brain disorders would affect immune cells – particularly the cancers connected with non-Hodgkin's lymphoma. They found that antidepressants such as Prozac also killed lymphoma cells, opening up new possibilities for treating the disease.

They quickly realised that many drugs on the market could have multiple medical uses and so, in March 2007, Celentyx Ltd was born. Professor Barnes explained: 'Finding new uses for drugs with a proven clinical safety record is an exceptionally efficient way to work. These compounds have already been through rigorous safety testing and so it saves considerable money in research and development terms.'

The company has enjoyed phenomenal success so far, thanks to its highly efficient, relatively low-risk drug discovery strategy – Immuno-Profiling™. Normally drug manufacturers have roughly a one in 10,000 chance of a new drug making it to market, but with Celentyx this figure is slashed to one in five.

Celentyx benefits from unrivalled expertise in neuroimmunopharmacology, and strong links to the world-renowned Medical Research Council (UK) Centre for Immune Regulation in the University of Birmingham's Medical School.

'We are delighted to have been given the chance through the Innovation Voucher Scheme, to work with Professor Burke at the University of Birmingham to undertake this trial.'

Liz Chapple, MD, Oral Health Innovations Ltd

Innovation Vouchers Scheme

Learn more
www.industry.bham.ac.uk

Improving Oral Health

'Innovation Vouchers' is a unique scheme which invites SMEs to apply for £3,000 to purchase academic support from one of the 13 universities in the West Midlands – including the University of Birmingham.

Being awarded an Innovations Voucher enabled Oral Health Innovations Ltd, a company focusing on preventive oral care, to work with Professor Trevor Burke at the University of Birmingham to design and coordinate a 12-month trial in ten dental practices.

The trial examines the impact of using a risk and disease-assessment system called PreViser on patient motivation, quality of life and improvements in oral health.

Liz Chapple, Managing Director at Oral Health Innovations, said: 'Previous studies have shown how our technology accurately assesses a patient's risk of developing gum disease, which is the biggest cause of tooth loss in adults. Importantly, if identified early enough, gum disease can be stopped and we can keep our teeth for life.'

'This trial enables us to quantify PreViser's impact on motivating patients to make that important choice. We are delighted to have been given the chance through the Innovation Voucher Scheme to work with Professor Burke at the University of Birmingham to undertake this trial.'

think energy

Birmingham Science City - Hydrogen Energy project

The £6.5m Hydrogen Energy project represents the creation of state-of-the art facilities for hydrogen and fuel cell technology research in the West Midlands and was funded by Advantage West Midlands under the Birmingham Science City Initiative. It is a key part of a larger investment in the research infrastructure of the West Midlands region, which unites the Universities of Birmingham and Warwick in a recently formed Science City Research Alliance (SCRA).

Birmingham Science City

Learn more
www.birminghamsciencecity.co.uk

The project seeks to develop new processes and technologies for the sustainable production of hydrogen and other high-value chemicals, the efficient separation and storage of hydrogen, and the utilisation of hydrogen as an energy vector in fuel cells as part of the progression to a low carbon society.

The range of capability and expertise available includes:

- Biochemical hydrogen production from organic waste and biorefining
- Thermal technologies for hydrogen and platform chemical production
- Solid-state hydrogen storage
- The development of fuel cells for transport and domestic applications
- Materials development for hydrogen technologies

The project also supports a number of demonstration facilities allowing researchers to evaluate hydrogen technologies in real applications and demonstrate benefits to end users including:

- A hydrogen refuelling station and five hydrogen fuel cell vehicles in operation on campus at the University of Birmingham used for a variety of roles including postal delivery
- Augmented by additional vehicles from the CABLED project
- The Protium hydrogen fuel cell canal boat project which demonstrates an onboard solid-state hydrogen store and permanent magnet electric motor
- A hydrogen powered house incorporating a commercial demonstration unit of a Combined Heat and Power (CHP) system

A key aim of the project is the encouragement of industrial and academic collaborations. It provides an opportunity for business and industry to access the latest thinking and state-of-the-art research/testing equipment available in the field. In further support of this project, £5.5m has been committed by EPSRC (Engineering and Physical Sciences Research Council) to underpin the activity through the creation of a Doctoral Training Centre, which will fund 50 hydrogen and fuel cell PhD projects with industry over the next nine years.

think advanced manufacturing

A partnership of great chemistry

Birmingham Science City researchers at the University of Birmingham have been working with Unilever UK to investigate the distribution of active ingredients for the application for personal hygiene products

Unilever is one of the world's leading suppliers of fast-moving consumer goods. Within the personal care market, they are global leaders in products for skin cleansing, deodorants and antiperspirants. They employ 179,000 people in 100 countries worldwide and invest €1 billion every year on research and development.

The work has made use of one of the many state-of-the-art pieces of equipment that has been made available as part of the Birmingham Science City programme, a Confocal Raman Microscope. Raman microscopy, and in particular confocal microscopy, has very high spatial resolution and Raman imaging is a powerful technique for generating detailed chemical images based on a sample's Raman spectrum.

Raman spectra were acquired using an infrared laser source together with two-dimensional maps of the distribution of product ingredients. A wide variety of Raman images were created which take the researcher well beyond what the eye can see.

This analysis has provided beneficial information for the future optimisation of effective product formulations.

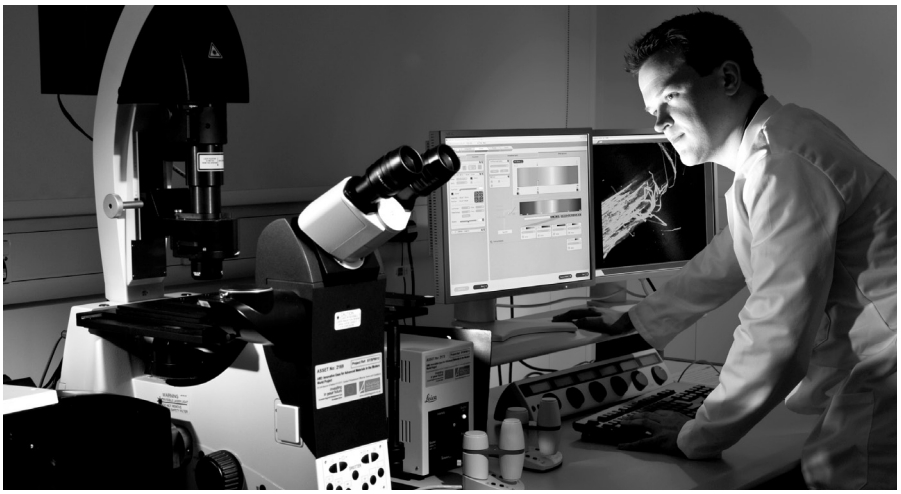
The University of Birmingham has one of the largest concentrations of Chemical Engineering expertise in the UK, with an excellent reputation in learning, teaching and research. Its Chemical Engineering School is within the top five of the country. It combines global experts in their field, together with leading edge facilities and laboratories.

'Working with researchers at the University of Birmingham has been a real benefit to our business and their expertise is invaluable. We look forward to continuing this relationship…'

Nick Ainger, Unilever R&D UK

Birmingham Science City

Learn more
www.birminghamsciencecity.co.uk



Inanovate

Opening doors to a smaller world

University of Birmingham spin-out company, Inanovate was founded in 2005, leveraging a unique nanoscale surface fabrication technology developed at the Nanoscale Physics Research Laboratory, headed up by Professor Richard Palmer at the University of Birmingham.

This novel approach to surface fabrication enabled breakthroughs in protein micro-array surface technology, culminating in Inanovate's first product, the i-Slide™, the World's premier surface for protein microarray experiments.

The unique nanoscale surface technology, has been integrated with novel protein screening procedures and detection systems to form the basis of a powerful point of care diagnostic system for early stage cancer, called the i-Screen™.

Managing Director, David Ure, is also an alumnus of the University of Birmingham, and heads up operations in both the US and UK. Inanovate's industry leading expertise and facilities crossing business, biology, chemistry, physics and nanoscale engineering, provides them with a unique and powerful base to continue to grow as a leader in clinical and pre-clinical protein biochip systems.

Inanovate would be interested in hearing from private and institutional investors, as well as potential strategic partners in the medical diagnostics field, with a view to raising further investment in early 2011.

University of Birmingham spin-out companies

Learn more
www.alta.bham.ac.uk

think environment

Cleaning up!

Angela Murray, a pioneering postgraduate, studying for her PhD in Chemical Engineering at the University of Birmingham has developed an innovative method of recovering platinum, rhodium and palladium from roadside dust released from Catalytic Converters.

Angela has now formed a spin-off company called Roads to Riches to realise the commercial potential of the technology. In addition to monetary benefits the project also has significant environmental benefits by reducing platinum mining.

'People laugh and say it can't be worth it' said Angela, 'But you're at the level of a low-grade mine. And in mining, you have to go deep underground which is intensive and environmentally damaging. Our process means that it is sitting on the surface just waiting to be collected.'

Alta Innovations Ltd, the University's technology transfer company have filed a patent around this technology and are currently in active discussions with a number of potential commercial partners to take this product to market.

'This is an exciting technology and we already have interest from industry that can see the commercial potential for turning waste, which incurs landfill charges, into a profitable business opportunity.'

John Pearson, Business Development Manager, Alta Innovations

Biofouling
not such a drag

Scientists at the University of Birmingham have led a project that has discovered an eco-friendly way of boosting fuel-efficiency in ships by combating the unwanted growth of marine organisms. So-called biofouling' can add up to 60 per cent of 'drag' to a ship, increasing fuel consumption and greenhouse gas emissions.

The project led by Professor James Callow and Dr Maureen Callow in the School of Biosciences, has used nanotechnology to develop a series of coatings which work on the principle of providing a surface patterned at a very fine scale, so that marine organisms, such as barnacles and seaweeds, find it difficult to attach.

The pioneering findings which are in the process of being patented, have emerged from a five-year, €12 million collaborative project known as AMBIO (Advanced Nanostructured Surfaces for the Control of Biofouling). The project has involved surface scientists, physicists, nanotechnologists, polymer scientists and marine biologists in Europe and has been funded by the European Commission.

With 31 partners, including ten universities, 15 companies and six major research organisations, AMBIO has covered the spectrum from basic science to marketplace, offering the promise of eco-friendly 'smart' coatings being made commercially available.

It is estimated that without antifouling measures, fuel consumption of commercial shipping fleets would rise by up to 40 per cent equal to 120 million tonnes of fuel a year.

Ambio

Learn more
www.ambio.bham.ac.uk

'The search is on for more environmentally friendly ways of deterring marine life from hitching a ride on the hull of a vessel.'

Professor James Callow

Traditionally, biofouling has been controlled via paints containing biocides which work by killing marine organisms. But as Professor Callow explains, new regulations now require that such paints do not have adverse impacts on non-target species. 'The search is on for more environmentally friendly ways of deterring marine life from hitching a ride on the hull of a vessel,' he says.

One of the partners in the project, International Paints, the world's largest maker of marine coatings, has conducted extensive field tests of the coatings on rafts and pleasure craft, with tests on larger ships now taking place.

According to Professor Callow, the total global market for antifouling coatings for ship and pleasure craft is worth approximately 700 million dollars a year, providing tantalising opportunities for the commercial exploitation of Birmingham's ground-breaking successes in this area of bioscience.

think business

Helping to up-grade key African trade routes

The North-South corridor is an initiative that aims to get goods to market faster and cheaper with improved infrastructure and more efficient border crossings across East and Southern Africa. The project, which is being financed by the World Bank, international development agencies and the private sector, aims to raise the standard of living of millions of people in Sub-Saharan Africa.

Using the Highway Development and Management Tool (HDM-4), University of Birmingham's Dr Jennaro Odoki undertook a consultancy project that provided strategic analysis to this project demonstrating the economic benefits of an efficient corridor based approach. (Dr Odoki was a leading participant in the international effort that led to the development of the specific highways software used in this project).

'We are grateful... to use the expertise of Dr Tony Hasting and the resources of the University of Birmingham for a project that our company may not otherwise have been able to afford. We were very happy with the report that Dr Hasting produced and would like to continue to develop links with Universities.'

Kelvin Lee, Managing Director, Drywite Ltd

Knowledge Transfer Partnership

Drywite, a small family owned business, have been manufacturing vegetable preparations to catering and vegetable industries since 1933.

Their main product is sulphite based and over the years has developed strong UK and export markets. However, the increasing trend is for organic non-sulphite products, so in order to retain their position in the marketplace they required expert help to enable them to develop a sulphite free solution that would be effective and economical to use.

Most fresh fruits and vegetables have a pronounced tendency to discolour to a greyish-brown after periods of storage producing an appearance that is unacceptable to consumers. The main focus of academic work carried out has been on enzymatic browning, one of the primary reactions responsible for such discolouration.

The University of Birmingham has the largest chemical engineering-based food research group in the UK, incorporating research into structured foods, flavour delivery and food hygiene. The University was therefore ideally placed to help, and is now working with Drywite under the Knowledge Transfer Partnership (KTP) scheme*. The KTP project will develop a chemical route to provide a six day shelf life for peeled potatoes. The challenge will be to come up with a solution that uses environmentally acceptable chemicals, retains key product characteristics such as colour, and can be implemented in a commercial operation.

*This Partnership received financial support from the Knowledge Transfer Partnerships programme (KTP) funded by the Technology Strategy Board along with the other government funding organisations.

Knowledge Transfer Partnerships

Learn more
www.industry.bham.ac.uk

IQ booster

You can boost your organisation's knowledge and resources by tapping into world-class expertise at the University of Birmingham. We're constantly making exciting breakthroughs – in medicine and engineering, energy and social science – and then making them available to the people who will benefit most.

Here is just a snapshot of some of the technologies currently available from Alta Innovations, the University of Birmingham's trading and commercialisation company.

Technology and IP

Learn more
www.alta.bham.ac.uk

Title	What is it?	Availability
Reconfigurable Antennae for Wireless Communications	A compact antenna for mobile devices, such as phones, laptops and PDAs, that will operate across a range of bandwidths.	Licence Agreement
A new genetic test for severe erosive Rheumatoid Arthritis	A new predictive test for severe erosive rheumatoid arthritis. This predictive test can lead to early identification of the disease and to lifestyle changes which may improve disease outcomes.	Licence Agreement
Urinary Markers of Adrenal Tumors	A set of urinary markers that differentiate malignant tumours with poor prognosis from benign tumours.	Licence Agreement, Joint Venture Agreement
Platinum Recovery from Road Dust	A method of recovering platinum deposits originated from catalytic convertors from roadside dust.	Licence Agreement, Joint Venture Agreement
Assessing the Impact of Stroke on Cognitive Abilities	A set of psychological tests to assess the abilities of individuals following a stroke. A useful tool to predict recovery and measure outcome.	Licence Agreement, Joint Venture Agreement
Using Polymers to Liberate Cell Membrane Proteins	A method for combining polymers with cell membrane lipids to produce disc-shaped nanoparticles, which are a useful tool in cell research and drug discovery.	Licence Agreement
An Early Diagnostic for Muscular Dystrophy	An Early Diagnostic for Muscular Dystrophy which allows better treatment outcomes.	Licence Agreement, Joint Venture Agreement
Rapid Production of Ceramic Moulds for Investment Casting	A new rapid shell build method using super-absorbent polymers reducing shell build time.	Licence Agreement
Histone Antibody Screening	An assay which allows the binding properties of histone antibodies to be characterised.	Licence Agreement, Joint Venture Agreement
Euclid Interferometer	EUCLID is a compact laser interferometric measuring device capable of sensing at the pico metre level (10^{-12}).	Licence Agreement

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