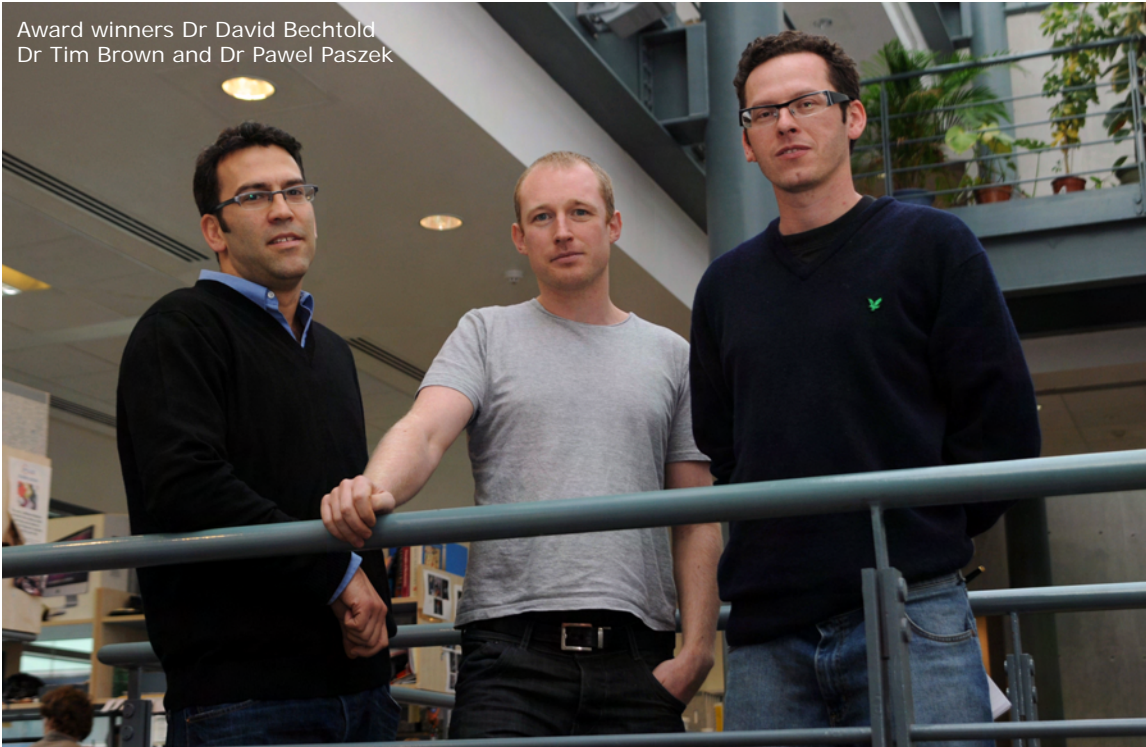


Triple success for FLS

Award winners Dr David Bechtold
Dr Tim Brown and Dr Pawel Paszek



Three young researchers from the Faculty of Life Sciences (FLS) have just been awarded the prestigious David Phillips Fellowships by the Biotechnology and Biological Sciences Research Council (BBSRC). These fellowships are designed to support outstanding scientists in the early stage of their research careers.

This year, the BBSRC awarded just four of these fellowships, and three were given to FLS researchers: Dr David Bechtold, Dr Tim Brown and Dr Pawel Paszek. In making these awards, BBSRC sought to identify young researchers who could be expected to be among the leaders of their generation of bioscientists.

This success is a remarkable indicator of the quality of research being carried out in FLS, and a great reward for the three scientists concerned, who all work in different areas. We asked each of them to describe their research area:

Dr David Bechtold: "My research examines how our internal timing systems (circadian clocks) orchestrate metabolic processes across the body (such as glucose storage/release by the liver) to reinforce proper energy balance. This is of particular relevance given that modern 24-hour/day lifestyles which disrupt our bodies' natural rhythms also increase the risk of obesity."

Dr Tim Brown: "My principle aim is to understand the subconscious regulation of body systems by light. This includes delineating the brain pathways that set the 'body-clock' to environmental time, as well as those underlying more direct effects of light on hormone secretion and other aspects of physiology."

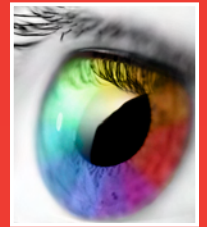
Dr Pawel Paszek: "My aim is to understand how a set of molecular networks orchestrates inflammatory signalling in cells and tissues. I am using interdisciplinary systems biology approach to gain a better picture of these non-intuitive processes. This is key to improved therapeutic strategies for inflammatory disease."

In addition to this exceptional success, two other academics from Life Sciences have been awarded major fellowships this year.

Dr Shane Herbert has received a Wellcome Trust Research Career Development fellowship to decipher the complex mechanisms that regulate new blood vessel formation (angiogenesis).

Dr Adam Hurlstone has been awarded a European Research Council fellowship to study the molecular and cellular biology of melanoma (skin cancer), with the aim of identifying new therapeutic approaches for its treatment.

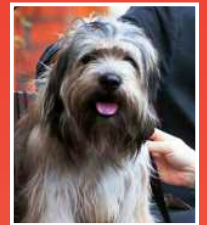
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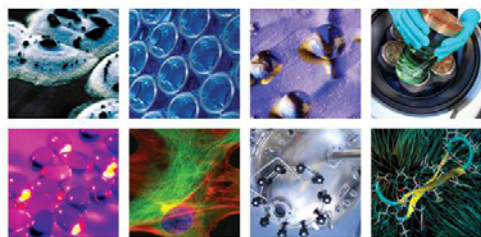
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£1.6m grant success for bioprocessing research



Dr Robin Curtis, Professor Jeremy Derrick, Dr Jim Warwicker, Professor Hans Westerhoff and Professor Alan Dickson



BRIC • BIOPROCESSING RESEARCH INDUSTRY CLUB

The University of Manchester has secured two project grants worth a total of £1.6 million from the Bioprocessing Research Industry Club (BRIC), which was set up by the Research Councils and industry.

Dr Robin Curtis, Professor Jeremy Derrick, Dr Jim Warwicker and Professor Alan Dickson have received funding for a multidisciplinary project to improve the production of proteins (biopharmaceuticals) that are used as medicines.

The study — a collaboration between the Faculty of Life Sciences and the School of Chemical Engineering and Analytical Science — is entitled, 'Understanding and predicting aggregation in biopharmaceuticals — an integrated approach towards improvement in bioprocess yields.'

The second BRIC project grant has been awarded to Professor Hans Westerhoff, Professor Roy Goodacre and Professor Alan Dickson to investigate the predictability of biopharmaceutical protein production. The research will be carried out in collaboration with the School of Chemical Engineering and Analytical Science, the School of Chemistry and the Faculty.

In addition, two research groups at the University have been awarded BRIC PhD studentships: 'Protein burden in overproduction' (Westerhoff, Dickson, Snoep, Warwicker) with industrial partners at Fujifilm Diosynth Technologies; and 'Controlling liquid-liquid phase separation in antibody formulation' (Warwicker, Curtis) with Medimmune.

"These grants and studentships build on our previous BRIC funding successes and reflect the emergence of integrated industrial and academic research programmes in bioprocessing co-ordinated through the activities of the University's Centre of Excellence in Biopharmaceuticals," said Professor Dickson.

BRIC was established in 2005 by the BBSRC, EPSRC, bioProcessUK and a consortium of industrial partners to address the research challenges in bioprocessing.

Student wins prestigious prize

Congratulations to Daniel Henderson who has won the British Pharmacology Society (BPS) Undergraduate Award. Daniel, an intercalating medical student, won the prize for the research he carried out as part of his Pharmacology lab project in Wythenshawe Hospital.

This award not only highlights Daniel's hard work and ability, but also the benefits of collaboration between the Faculty and the Faculty of Medical and Human Sciences.

Daniel said, "I really enjoyed intercalating and although I found it challenging, winning the award really makes you appreciate that the work was worth it. It is also a testament to the hard work, patience and enthusiasm of my supervisors Richard Prince, Sue Astley and Caroline Boggis".

As part of his prize Daniel will attend the winter BPS conference and has also been asked to produce a poster of his work. "I'm really looking forward to the winter conference. Being able to go and meet the people at the forefront of British/international pharmacology will be a huge privilege," he said.



European grant for skin cancer research

Life Sciences researchers investigating skin cancer have been awarded a European Research Council (ERC) grant worth €1.5 million.

Dr Adam Hurlstone and his team in the Faculty use zebrafish – small tropical fish often kept as pets – to study deadly melanoma.

Melanoma is a type of skin cancer that is caused by excessive ultraviolet (UV) rays in sunlight that transform skin cells from helpful cells that protect our skin, known as melanocytes, into malignant cells.

The Hurlstone laboratory is hoping to find ways to detect this process of transformation more easily and rapidly, and to develop therapies designed to prevent, delay or even reverse this change in skin cells.

The Hurlstone laboratory uses the zebrafish to study this process in detail since the fish have melanocytes in their stripes, are simple to keep, observe, genetically modify and can develop melanoma.

Dr Hurlstone was among only a handful of applicants from the UK to succeed with his application to the ERC under their 'Starter Grant' scheme. The award will support research efforts in his laboratory for the next five years.



Academia europaea double honours



Two Faculty of Life Sciences Professors have become members of one of the world's most prestigious academic bodies. Professors Richard Grecnis and Andrew Loudon were elected members of the Academia Europaea – also known as the Academy of Europe.

The Academia Europaea is a European, non-governmental association of scientists and scholars which aims to promote learning, education and research. Founded in 1988, the Academy has over 2000 members, including leading experts from the physical sciences, technology, biological sciences, medicine, mathematics, humanities, social and cognitive sciences, economics and the law.

Amongst the members are thirty-eight Nobel Laureates, several of whom were elected to the Academia before they received the prize.

The Board of Trustees at the Council of the Academia Europaea confirmed the election of four University of Manchester Professors, at a meeting in October – John Harris and Luke Georghiou from the Faculty of Humanities have also been selected.

University of Manchester Professor Emeritus Nigel Vincent, currently Vice-President for Research at the British Academy, said: "All these individuals are to be warmly congratulated. Four elections in one institution in a single year is rare and a clear testament to the continuing international excellence of The University of Manchester across the natural sciences, the social sciences and humanities."

New researcher science communication award

Congratulations to Emily Robinson, who has been named the winner of the Society of Biology's New Researcher Science Communication Award. Emily is a neuroscience PhD student in the Neuroscience Research Group. Recently, she has made an impact as a science communicator by organising workshops about the brain, winning the Wellcome Trust funded competition 'I'm a scientist... get me out of here', showcasing the work of the Brain Inflammation Group and being involved in events to communicate and discuss stroke research with stroke patients and carers.

Emily said: "My experiences have highlighted the public's appetite for science. To capitalise on this scientists, need to be creative and explore new ways to engage. This award will give me the self-belief to further push the boundaries of science communication."

Brand new facilities for our optometrists!



The University of Manchester's Optometry facilities have recently relocated from the North Campus to the brand new Carys Bannister building on Dover Street. The building is named after a pioneering Manchester-based doctor who was one of the first female neurosurgeons in Britain.

The student teaching clinics and the private Vision Centre, both based within the building, conduct eye examinations, provide spectacles and contacts lenses, and offer additional services such as screening

for glaucoma and diabetes to the general public. Specialist optometric equipment within the unit, including topographers and high-quality digital cameras, is used to enhance the service offered by the clinics and facilitate ongoing research projects.

The building is also the new home to Eurolens Research, a long established research group that conducts contact lens clinical studies for contact lens manufacturing companies around the world. It regularly undertakes projects for global

organisations and coordinates as many as thirty clinical studies per year.

Dr Philip Morgan, programme director for optometry and director of Eurolens Research says, "We are delighted to be in the new home for optometry ... Years of careful planning for the new clinic areas mean that we have a new state-of-the-art facility for teaching optometry and training future professionals".

Carbon monoxide mystery solved

A team of FLS researchers led by Professor Nigel Scrutton have discovered why carbon monoxide gas produced within the body is not fatal.

The team who collaborated with colleagues from Liverpool and Eastern Oregon Universities found that when inhaled in large volumes, carbon monoxide is deadly because it binds to molecules called haemproteins and prevents them from transporting oxygen.

Curiously, low levels of carbon monoxide are produced naturally in the body but this is not fatal. The team discovered that when haemproteins sense low levels of carbon monoxide they change shape, preventing the gas from binding.

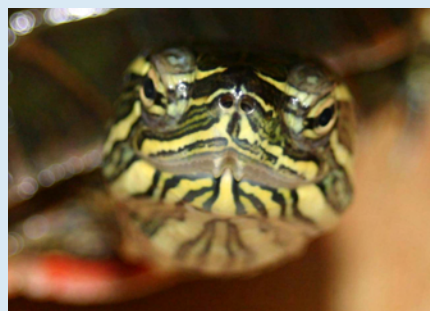
This has important implications as haem-based sensors could be used as gas monitors in industrial settings.

Grant success for turtle study

Dr Holly Shiels, a Senior Lecturer in the Faculty, has been awarded an exciting Leverhulme Trust basic sciences research grant for £154,621 to fund an innovative new project on anoxia tolerance in the freshwater turtle.

The Leverhulme Trust Awards are unusual in that they are not targeted to any specific subject area, instead but 'support talented individuals as they realise their personal vision in research'. Dr Shiels and her colleague Dr Gina Galli will investigate how freshwater turtles manage to survive without oxygen for up to 12 hours without damage to their body, heart or even their individual heart cells.

This project will yield knowledge in the fields of evolution, animal physiology and most importantly could have a wider impact on the treatment of heart conditions, such as angina, heart disease and heart attack.



A dog's life: £500k study launched into man's best friend



Researchers from the University of Manchester have launched a £500,000 study into the relationship between man and his 'best friend'.

The project aims to identify how man has influenced domestic dogs through breeding, feeding, training and socializing.

In recent years pure bred dogs have been a subject of controversy. Three years ago the RSPCA and the BBC pulled out of Crufts dog show citing concerns about the health of pedigree dogs.

Project leader Professor Michael Worboys said: "Despite their importance in many people's lives, dogs have been neglected by social scientists" and went on to stress that "the dog was transformed in the 20th century by the application of science and medicine: no animal species has been

more altered in size, shape, colour or temperament by human selection".

The project will also investigate the history of stray and 'dangerous' dogs, as well as the use of dogs in the laboratory for health and medical research.

Matthew Cobb, Professor of Zoology in the Faculty of Life Sciences and a co-investigator on the project, added: "Veterinary medicine and animal health has been poorly served by researchers despite the subject being given priority funding for many years".

"We will also explore how aspects of human-dog relations have been increasingly medicalised, to the point where dogs are called 'patients' and vets' records list them by their names, not those of their owners."

Dirty science at glastonbury

If you want to teach people that a little bit of dirt is a good thing, there is no better place to go than the Glastonbury Festival.

Scientists from the University, working with the Wellcome Trust and Guerilla Science, ran a demonstration at Glastonbury showing revellers just how much we need bacteria in our everyday lives. This included a display of 100 agar plates containing just some of the microorganisms normally found in humans – we have one kilogram of bacteria in our gut alone!

Through this interactive exhibit, festival-goers were convinced that perhaps their mud-encrusted wellies weren't so scary after all.



Hope for antiviral treatment for Alzheimer's



Alzheimer's disease and cold sores might seem to be two very different problems. However, Faculty scientists believe that they may be linked and that current antiviral drugs could prove to be effective in slowing the progression of Alzheimer's disease.

A team of Manchester scientists, led by Professor Ruth Itzhaki, have shown that the cold sore virus (herpes simplex virus type 1), when present in the brains of individuals with a specific genetic susceptibility, can lead to an increased risk of developing Alzheimer's disease.

The team observed that the herpes virus causes cells to overproduce a number of proteins. These proteins, when found in high concentration, can stick together, forming structures known as plaques and tangles. Scientists believe that these 'sticky' proteins, and the plaques and tangles they form, play an important role in the development of Alzheimer's disease. The group has recently published promising findings showing that

certain antiviral treatments can reduce production of these dangerous proteins. This work, carried out with Dr Matthew Wozniak in the Faculty of Life Sciences, can be found in the open access journal PLoS One.

Professor Itzhaki, who has been studying Alzheimer's and the role viruses play in its progression for over 20 years, is encouraged by these results. She hopes that following this success, further funding will be obtained to carry the work forward to the next stage – further laboratory testing of possible treatments, and progression to clinical trials. The impact of this research has already been recognised by Manchester City Council and the international organisation, 'the Alzheimer's Research Forum'. Both have recently presented Professor Itzhaki with awards recognising her outstanding work and contribution to the field.

Manchester's 'first step' to perfect drug combinations

Scientists at The University of Manchester have discovered a way of speeding up the creation of perfect drug combinations, which could help patients recovering from critical health problems such as stroke, heart attacks and cancer. The group, led by Professor Douglas Kell, used a new technique that combines two things you would not normally expect to see together: robots and evolution.

Using a computer program that mimics Darwinian evolution, the team reduced the number of drug combinations that needed to be tested from 9 billion to 550. A semi-automated robot enabled 50 drug combinations to be tested at a time. The 'fittest' or most effective combinations of drugs made it into the next generation where they were recombined and the process started again.

The study, published in *Nature Chemical Biology*, concentrated on finding a drug combination to reduce the inflammation and damage caused by stroke. However, the researchers believe the process they used can be applied to all drugs and for a huge variety of diseases – not necessarily related to inflammation.

Professor Kell said: "Most diseases have complex causes. This makes their analysis a problem of systems biology, and to find novel therapies multiple targets need to be attacked at once.

"We have devised a strategy, based on Darwinian evolution, to make this considerably easier. Although our immediate interest is inflammation and conditions such as stroke, our approach is universal and is thus applicable to all complex diseases."

The burly bird catches the girl

While the early bird might catch the worm, it's the quick bird that lands the ladies, according to new research into the running performance of an Arctic cousin of the grouse.

Scientists studying rock ptarmigan on the Norwegian archipelago of Svalbard discovered a large difference in the running capabilities between the sexes, with the larger males able to run more efficiently and up to 50% faster than females.

The team suggested that faster, efficient male birds are more successful at breeding, being able to defend larger territories against rivals, indicating that physiology,

and not just physical appearance, plays a role in sexual selection.

"Little is known about the role physiology – the internal biological functions of living organisms – plays in sexual selection in birds and other animals," said Dr Jonathan Codd, who led the study in the Faculty of Life Sciences.

The research group say their findings are important for two reasons. Some bird species, like some other animal species, exhibit obvious physical differences between the sexes. For instance, males, as well as females, can be many times larger than the opposite gender. Despite these

differences, scientists have rarely looked at their physiological consequences.

Secondly, the physical appearance of male and female birds – and other animals – is well documented as playing a role in sexual selection. Male birds are often more colourful than their drab female counterparts and it is known that this plays an important role in the success of males finding mates. This study shows that physiological attributes may also play a role in the breeding success of male birds, with females choosing mates that are faster and able to defend larger territories for longer.

'Dragon's Den'



The Faculty's mentoring team (from left to right): Bip Choudhury, Kath Else, Andrew Dean, Sheena Cruickshank, Amanda Bamford, Stuart Allan, Nicky High, Mark Travis, Emily Robinson, Ceri Harrop and Elizabeth Granger.

The start of the academic year saw public engagement in the Faculty get off to a flying start with the launch of new pilot project, Public Engagement 'Dragon's Den'. Designed and organised by Dr Ceri Harrop and Dr Amanda Bamford, the project aims to embed and sustain public engagement activity in the Faculty through a structured training and mentor programme.

Discussions with students and staff revealed that many felt they lacked the skills and confidence to deliver public engagement activities. In contrast, there are several postgraduates and staff highly experienced and skilled in public engagement, and it is these people who will mentor teams during the project. Mentors received skills training from Sandra Booth, Management Development Coordinator from the University's Staff Training & Development Unit, and will have ongoing support. Mentors will generously provide guidance to their team, and with Manchester Beacon funding, teams will design and deliver exciting public engagement activities for National Science and Engineering Week 2012.

A training day in September saw staff and students from across six disciplines, including life sciences, maths, material sciences and engineering working in small teams to create their own public engagement activities. The training day provided the opportunity for all delegates to try out activities that have been previously developed, through a session kindly run by Charlotte Alcock from the FLS's Student Recruitment team. The creativity and resourcefulness of the delegates was tested in a quick-fire 'Ideas Lounge' led by Ceri Harrop. In this session, delegates were given a series of design briefs and just 3 minutes to generate an idea for public engagement activities for

each brief! Activities were aimed at a wide range of audiences from parent and toddler groups to commuters at Manchester Piccadilly Railway station and covered a whole spectrum of topics that included vaccinations to building an aircraft! All the ideas were displayed on a wall, for delegates to later sign up for which project idea they wanted to take forward to the day's grand finale 'Dragon's Den' event. Sandra Booth provided valuable advice on how best to evaluate the success of an activity, and with this in mind, delegates worked in teams over lunch in a session led by Amanda Bamford to get their pitch ready for the afternoon's 'Dragons Den' session.

The 'Dragons' for the day were Anna Bunney, the Manchester Museum's Curator of Public Programmes; Tristan Bunn, Inspiring Young Scientists Co-ordinator at the BBSRC and Sandra Booth. The Judges Choice winner was "The Path to Poo", designed by Caroline Ridley and Janet Melling, an interactive family activity to be run at The Manchester Museum. David Ward, Richard Balint, Kamalpreet Waraich and Fayaz Rasheed won The Delegates Choice with "So you think you can build an aeroplane?", an inspiring school curriculum enhancement activity to explore the wonderful world of aerospace engineering through designing and building paper aeroplanes!

Several other projects have been funded and delegates will now work with their mentors to fine tune their activities ready for National Science and Engineering Week 2012.

To find out more about public engagement events across the Faculty, see

<http://www.ls.manchester.ac.uk/schoolsandcommunity>

Opening the doors to our community!

In July, the Faculty opened its doors to the public and hosted our very first Community Open Day. The people of Manchester were invited to meet creepy crawlies and the scientists who study them, as well as have look inside our labs – over 700 people came through the door.

Both children and adults were able to get hands on to make music with DNA, take a journey around the human body and feed the Faculty's bug-eating plants. Visitors were given the chance to see robots at work and watch living things through million-pound microscopes. Our guests were invited to try their hand at maggot painting, make creature crafts and have their face painted.

University scientists were available to talk about their work, including everything from cancer research and obesity busting to brain imaging and biofuel development. There were also tours of our research labs where scientists work every day.

A talk was given by from Dr Liz Sheffield on "The Good, the Bad and the Ugly" science in some well known animated films.

The Open Day was a huge success welcoming families from across Manchester, we only hope the Open Day for 2012 will be just as entertaining.



Science spectacular brings down the curtain on manchester science festival



Over 2000 visitors came to the University's Whitworth Hall and the Manchester Museum on Saturday 28th October for our Science Spectacular, a day of interactive exhibitions put on by the University of Manchester as part of the city wide Manchester Science Festival.

It was a fantastic day, which gave the public the opportunity to meet and talk to the scientists who are usually hidden away in their labs. 30 research groups from the University of Manchester were showcasing their work and the Faculty of Life Sciences played a major role in the event.

At the Fly station visitors discovered how flies get drunk, suffer from jet lag and have stem cells, as well as being shown how these animals play a vital role in researching human diseases such as cancer and epilepsy.

The Manchester Skin Research group had a stall showing how important your skin is. They had a special camera set up that allowed you to see how much your own skin had aged, as well as showing how the sun causes aging and wrinkling of the skin.

There was plenty of slime on offer with visitors being invited to explore the human gut. At the Eye Station there were demonstrations to show how the cells in the eye work and how that allows you to see, and those visitors who were not too squeamish could even have a picture taken of the back of their own eye.

The very messy, very hands-on Heart Station staffed by the University researchers from the British Heart Foundation here at the University showed how the heart pumps blood around the body, and had quizzes and demonstrations on how the heart keeps

pumping and how this keeps us alive.

Our bodies are made up of many different cell types, each with different shapes and functions, the Living Cells station showed how these cells work together to make up our organs, there was also the opportunity to view the sub-cellular organelle structures which in turn enable the cells to do their jobs.

As well as the Faculty of Life Sciences, many other parts of the University showcased their research with stalls on nuclear energy, astronomy and even glow in the dark ice cubes courtesy of the school of Chemistry! As the day drew to a close it was clear that children, teenagers and adults alike had enjoyed a fantastic time which was only made possible by the hard work of the staff, students and volunteers who organised and participated in the event.

FLS podcast is launched

FLS is proud to announce the launch of our podcast — a popular science programme which is released every two weeks on our website. We aim to keep you up-to-date with the most recent and exciting biological discoveries.

Our podcasts are presented by Ceri Harrop and Greg Counsell.

Ceri is currently a postdoctoral researcher in the lab of Professor Dave Thornton. Her passion for science communication will see her soon migrating from the lab to her new role as Public Programmes Manager for the Cell-Matrix Research Centre, as well as the voice of the FLS Podcast.

Greg is currently working for Professor Matthew Cobb on a year-long placement in the Faculty of Life Sciences, working towards a career in multi-media science communication.



Presenters Ceri Harrop and Greg Counsell in the podcast studio.

Previous episodes have covered ecstasy as a possible cure for leukaemia, why humans have eyebrows, how our Indian summer confused plants and much more.

You can listen to our podcast via the front page of the FLS website at <http://www.ls.manchester.ac.uk/>

If you'd like to get in touch, please email: podcast@manchester.ac.uk.

Triple retirement

It is with both joy and sadness that we bid farewell to Professors John Pickstone, Maynard Case and Arthur Weston as they retire from the University. All three have made tremendous contributions to the Faculty of Life Sciences and will be greatly missed both personally and professionally; we wish them all the best for the future.

Professor Maynard Case joined the University as Professor of Physiology 22 years ago and since has twice been appointed Dean of the School of Biological Sciences as well as to a number of other senior posts. He has also held the position of Associate Vice-President for Compliance, Risk and Sustainability since 2002, while pursuing his research on fluid and electrolyte transport in epithelia.

Wellcome Research Professor John Pickstone arrived in Manchester in 1974 and established the Centre for the History of Science, Technology and Medicine before being awarded his professorship in 2002. As well as continuing with his research into the history of cancer, the university and ideas from his book on Ways of Knowing, John



Retirees (from left to right) Professors Case, Weston and Pickstone

will carry on working on the Manchester Histories Festival. He has also started a new official role as Advisor on University Heritage.

Leech Professor of Pharmacology Arthur Weston retired on September 30th after a total of 43 years' service in the University.

In retirement, he intends to continue with his vascular pharmacology research, as a Senior Editor of the British Journal of Pharmacology and Visiting Fellow at Magdalen College, Oxford. Arthur is also a candidate for election for the Presidency of the British Pharmacological Society.

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Eurolens Research is part of The University of Manchester and its research is regulated by the University of Manchester Senate Committee on the Ethics of Research on Human Beings

Careers speed dating event 2012

Have you graduated from the Faculty in 2011 and would like some advice on potential careers?

or

Have you graduated from the Faculty five or more years ago, work in a role outside of research or academia and would be interested in acting as an expert mentor at our exciting upcoming event?

We are planning a 'Careers Speed Dating Event' on 15th March 2012. The aim of the event is to give our new graduates and students the opportunity to find out more about careers available to life sciences graduates outside of the traditional areas of research and academia. We will be inviting alumni from selected fields to tell our students and new graduates about their careers and giving advice on how to secure a job in the same field.

Further details and booking will be available later in the year. For more information or to volunteer as a mentor email: charlotte.alcock@manchester.ac.uk

Editor's note:

If you have any comments or contributions for future editions of the Newsletter, please contact the Faculty of Life Sciences:

Faculty Communications Officer
Natalie Liddle
Tel: 0161 275 5765
Email: natalie.liddle@manchester.ac.uk

Associate Dean for Social Responsibility
Professor Matthew Cobb
Tel: 0161 275 5419
Email: cobb@manchester.ac.uk

*With thanks to contributors:
Natasha Bray, Greg Counsell, Sarah Fox, Liz Granger, Ceri Harrop, Laura Jones, Emily Robinson, and Louise Walker*