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The University of Manchester

Faculty of Life Sciences Newsletter

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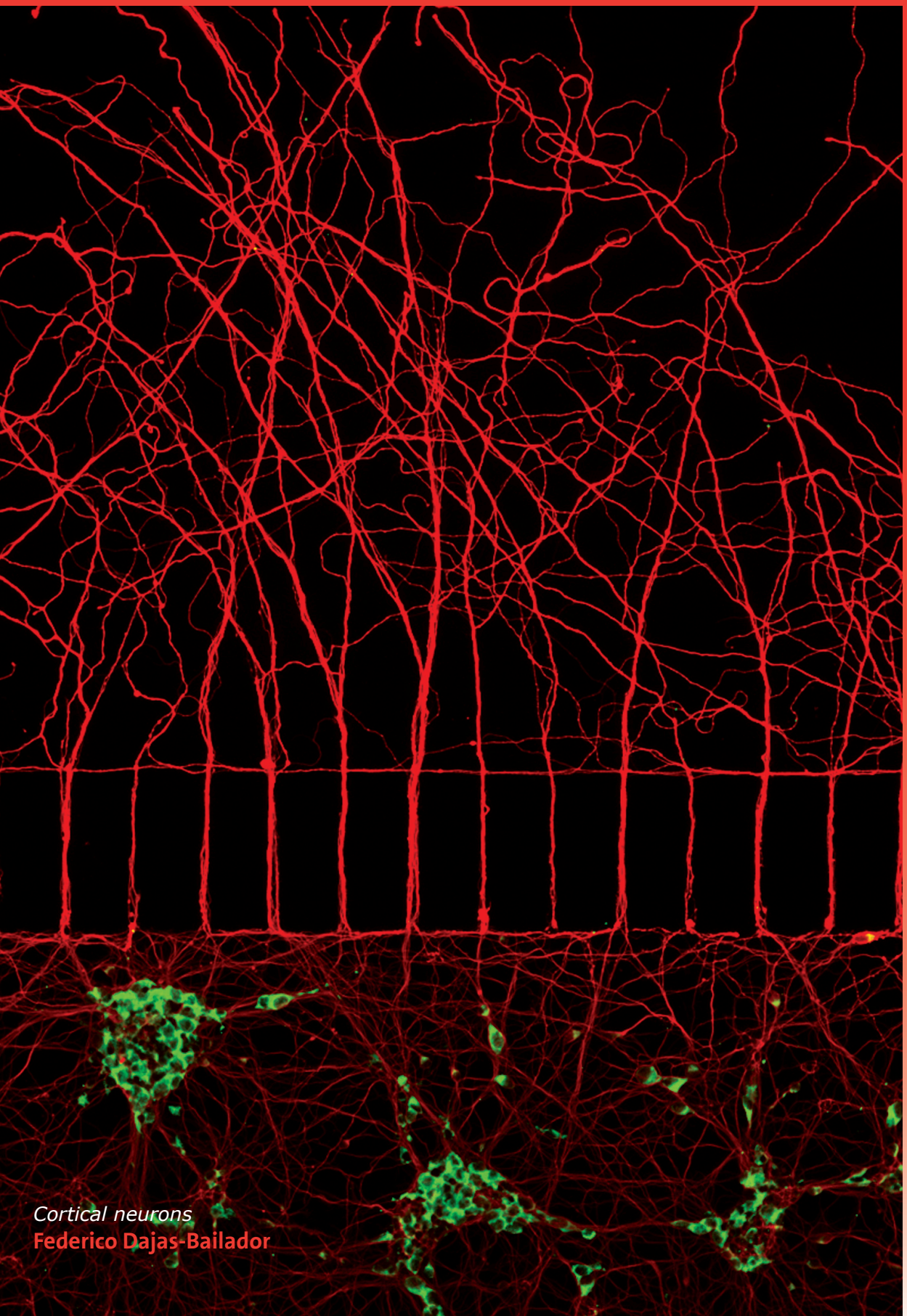


Cortical neurons
Federico Dajas-Bailador

In this issue

Message from the Associate Dean for Teaching, Learning and Students

Universities have two main jobs: carrying out research to understand how the world works, and imparting that knowledge to students. We excel at both of these, and our current crop of graduates confirms that we have one of the liveliest and brightest groups of students in the country, who have learned an exceptionally broad range of skills during their time here.

Students can study a wide portfolio of topics – degrees from Anatomy to Zoology, and courses from 'The Chemistry of Biomolecules' to 'Animal Diversity'. All of our teaching is 'research-led', which means that, in the final year especially, we encourage staff to teach the subjects in which they are world-leading experts.

For many students, the highlight of their years in Manchester will be the time they spent away from the city. This is not as alarming as it sounds – students may spend a year carrying out research in locations as exotic as Costa Rica or Gambia, an experience that can change the future course of their lives. We have an unsurpassed range of Field Courses that allow students to gain amazing insights into the world and to obtain vital skills that can lead to employment, such as the Animal Behaviour course in South Africa and the Urban Biodiversity and Conservation course.

This year, we have begun to broaden our range of final year projects, with the introduction of ground-breaking Science Media Projects. These enable students to develop their writing and communication skills, preparing them for future careers in science communication.

Our students are our legacy, as much as the research we produce. They are the people who will make the world in the 21st century. We are immensely proud of their achievements, and of their enthusiastic participation in the life of the Faculty. Without our students, the University would have no meaning.

Professor Catherine McCrohan
Associate Dean for Teaching, Learning and Students, Faculty of Life Sciences

Garran Dodd short-listed for ABTA Doctoral Research Award

Films about cannabis smokers often feature a comic scene where people get 'the munchies' and become ravenously hungry.

Some important science underlies this effect, as shown by postdoctoral researcher Dr Garron Dodd, who recently won an ABTA (Association of British Turkish Academics) award for his studies into the cannabinoid receptor in the brain, which produces 'the munchies'. Cannabis stimulates this receptor; Garron looked for a compound that could block the receptor, thereby reducing hunger.

He found that a chemical that naturally occurs in the brain, called hemopressin, blocks the cannibinoid receptor and thereby modulates our appetite. This work not only suggests that hemopressin works as a hitherto unknown neurotransmitter, it may also provide important approaches for the development of novel anti-obesity treatments.

Going green and making progress

The Faculty has been making small but important steps to meeting its targets for sustainable activity. We have reduced our electricity consumption by introducing LED lamps and have provided financial help to introduce the most energy-efficient freezers into all our laboratories.

One of the most notable signs of the greening of the Faculty has been the landscaping of the Michael Smith Building quadrangle.

Following a competition amongst staff and students, the winning layout was built last winter.

It has now literally bloomed, with a herb garden, a wild-flower border and extra bedding spaces which are currently the focus of a competition between different teams from the Faculty. Probably the most striking feature is the pond, which has already seen the emergence of damselflies that can be seen darting about the edges, and a number of tadpoles that are beginning to turn into frogs.

Graduate interview — Sam Pearson

In a short space of time Sam Pearson's career has really flourished. Sam graduated with a Zoology degree in 2009 and has already had the privilege of interviewing Sir David Attenborough. Here he tells us about his career in the media and gives advice to current graduates.

What was the best thing about studying at the University of Manchester and more specifically your course?
One of the best things was probably the city, it is uniquely diverse, and probably the best city in the UK to be a student. Living in the 'student village' of Fallowfield and being only a short commute from the university and the city centre on one of the best bus services I've come across was fantastic! Public transport will never be as easy (or as cheap) again!
With regards to Zoology, undoubtedly the best things were the field courses. Getting the opportunity to study in Ecuador, on a Scottish island and even getting out and about in Manchester were all brilliant. The culture, practical knowledge and ability to work in a team have proved very useful professionally, as well as being great experiences.

What career path were you interested in pursuing when you were a student?
Wildlife filmmaking (or pretty much anything relating to wildlife communication!)

How did you get into working in TV?
Getting into TV takes a lot of hard work and perseverance. Some of my friends and colleagues chose to do Masters courses in media-focused subjects, which are great for learning the practical skills and industry knowledge, but I'd had enough of formal learning and chose to dive in head-first! This meant starting from the bottom, securing internships and work-experience whist working in menial runner and production assistant positions in order to get the necessary industry experience. After a year of struggling and on the brink of deciding it wasn't for me, I managed to secure a job at ITV Studios working in the Factual department. This proved to be the turning point and has subsequently led to a variety of roles in several businesses, both in production and online.

I imagine the highlight of your career was interviewing David Attenborough – can you tell us a bit about it?
In my current position at UKTV I work as the Multiplatform Producer across all the factual channels, one of which is the natural history and science channel Eden. I produce online support for our programmes, including David Attenborough's Natural Curiosities, where Sir David addresses some of the curios that first inspired him to pursue a career highlighting nature's wonders. One of the supporting pieces for this series is an online interview using questions collected from Eden's fans across Facebook and Twitter, this provided a great excuse for me to go and meet him!
Watching him work is an absolute inspiration. Not only is he a font of knowledge, he works incredibly hard for long hours, retaining focus throughout the shoot. Before each scene he will take a quiet moment by himself to piece together what he'll say, and then deliver his piece to camera with incredible precision, usually in only one take.
It is an incredibly humbling experience meeting one of your personal heroes, never mind one of the most famous and admired people in the world! To say I was a bit nervous when the time came to ask him the questions would be an understatement!

Based on your own personal experiences, what advice would you give to recent graduates?
First and foremost your CV is most employers' first impression; make sure that yours is great by seeking advice from careers advisors or those in the profession. Work experience is a very useful way to bridge the gap between academic and professional experience, make relevant contacts, it's also a great way to find out whether you're suited! However, make sure that you aren't exploited as free or cheap labour — there needs to be a plan for you while you are there; shadow the right people, gain the right experience and don't end up just filing their paperwork.

Alan Turing and Life's Enigma

Alan Turing was born 100 years ago, in June 1912. Turing is widely known for his revolutionary work on computers, codes and artificial intelligence. In his final years, here at the University of Manchester, he studied one of the most mysterious phenomena in the world: how organisms grow. Turing's work on this subject, known as 'morphogenesis', is the focus of a unique exhibition at the Manchester Museum.

Alan Turing and Life's Enigma can be seen at the Manchester Museum until 18 Nov 2012.

Stay in touch

If you have just graduated please stay in touch and let us know where your career takes you. Also, if you feel that you might be able to support our future students by mentoring them or giving talks about your career we would love to hear from you.

email: charlotte.alcock@manchester.ac.uk
tel: +44 (0) 161 275 7700
www.ls.manchester.ac.uk/schoolsandcommunity/alumni

Alumni Association
Register with Your Manchester Online now and become and member of the University of Manchester's interactive alumni website where you can stay in touch with friends, keep your details up-to-date, register for events, sign-up for newsletters and much more.

Faculty Professor elected EMBO member

A University of Manchester scientist is one of just 55 biologists worldwide to be recognised this year by the European Molecular Biology Organisation (EMBO) for their excellence in research.

Professor Nancy Papalopulu, from the Faculty of Life Sciences, will join the 1,500-strong EMBO community of life scientists in the 2012 intake.

EMBO enables the best science by supporting talented researchers, stimulating scientific exchange and advancing policies for a world-class European research environment.

New members are elected annually on the basis of scientific excellence representing a broad cross-section of the life sciences. The latest scientists to join the group come from 17 different countries and include 21 female scientists recognised for their contribution to life sciences research.

Nancy said: "I am delighted to have been recognised in this way by such a prestigious organisation. Science knows no borders and I am looking forward to working with EMBO in promoting scientific excellence in Europe and beyond."

EMBO Director Maria Leptin said: "Our members are the basis for the excellent international reputation of EMBO and its increasingly global orientation. We welcome this group of exceptional scientists and look forward to their fresh input and ideas."
Professor Martin Humphries, Vice-President and Dean of the Faculty of Life Sciences, said: "I am delighted that Nancy's achievements have been recognised by EMBO. She has a very high quality track record in research, including a number of fundamental discoveries, and she has also demonstrated leadership in the developmental biology field. In contributing to EMBO's mission, she will be a great ambassador for her discipline, for Manchester and for the UK."

EMBO says the selected researchers will help shape the direction of the life sciences in Europe and beyond. EMBO members provide scientific input, such as acting on advisory editorial boards of the organisation's four scientific journals, serving on selection committees for EMBO programmes and giving general advice to the scientific community.

Babies' brains are programmed by what mums eat

Women who fall pregnant while dieting are more likely to have a child that could become obese or diabetic in later life, new research suggests.

Although the study, published in the Journal of the Federation of American Societies for Experimental Biology, was conducted in sheep, the researchers believe their findings are relevant to humans too, as they reveal a non-genetic, or 'epigenetic', way in which the DNA of offspring can be affected.

The research, led by Professor Anne White of the Faculty of Life Sciences, together with colleagues in New Zealand and Canada, may also have found a reason why human twins are more likely to develop type-2 diabetes in adulthood.

The study investigated twin pregnancies in sheep, as well the pregnancies of ewes that received less food around the time the lamb was conceived. The researchers then looked at tissues from the brains of the unborn lambs.

"We found that unborn twin lambs had changes in the structure of DNA in the region of the brain that regulates food intake and glucose that resulted in an increased chance of diabetes in adulthood," said Professor White. "Our findings provide a reason why twins are more likely to get diabetes but we have also shown that mothers who don't have enough food around the time of conception may have a child who grows up with an increased risk of obesity."

Professor White continued: "This is not an inherited change in the genes but a change in the structure of the DNA that affects the genes, and therefore much more unusual. The changes we have found are in genes that control food intake and glucose levels and alterations in these genes may lead to obesity and diabetes."

More and more people are becoming obese and getting diabetes, while rates of twins are steadily increasing as women have babies at older ages and rates of conception using artificial reproductive technologies increase. The team's findings in sheep, if replicated in humans, suggest that obesity and diabetes could be more likely in twins and in children from mothers who are not eating properly, or are dieting, around the time of conception.

Professor White added: "Our study is important because it shows that factors in the brain can be altered by non-hereditary mechanisms and this results in changes in the body, which could make people obese. The findings may provide a new understanding of why twins can develop diabetes and also suggests that dieting around the time a baby is conceived may increase the chance of the child becoming obese later in life."

While the study does not have immediate implications for the treatment of diabetes or obesity, the researchers say it could be important for disease prevention regimes whereby advice on eating is given to women who are planning a family that could reduce future health risks for their children.

Scientists discover cell's Achilles' heel

Manchester scientists concerned about the overuse of antibiotics have made a breakthrough in their pursuit of alternative treatments for serious diseases.

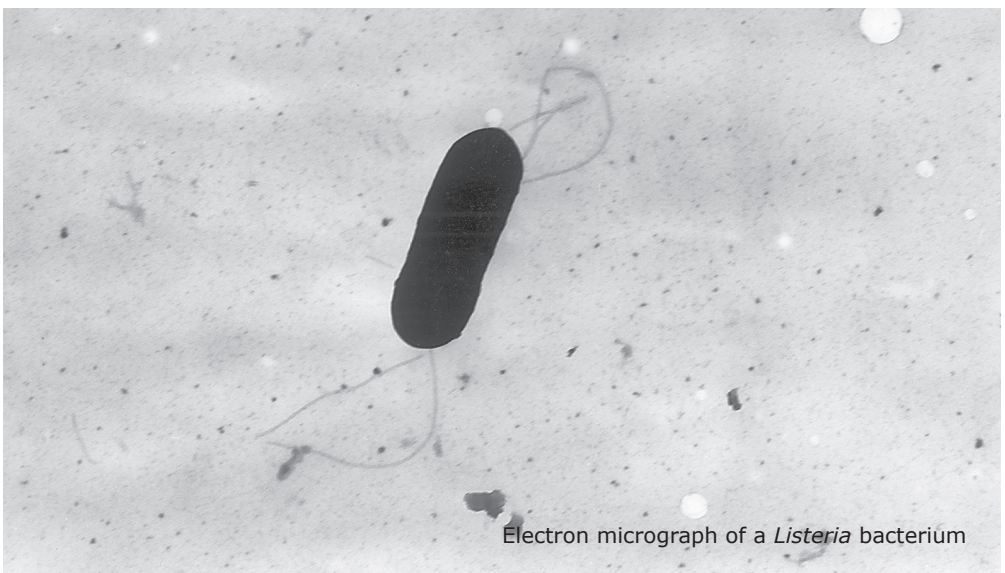
A team from the Faculty of Life Sciences believe they have discovered an 'Achilles' heel' within human cells that bacteria are able to exploit to cause and spread infection.

By targeting a protein called calpain, the team believes bacterial growth could be halted without the need for antibiotics. The researchers say many bugs have become resistant to antibiotics due to their overuse.

Listeria, a potentially deadly group of bacteria can be found in milk, fruit and vegetables and can cause meningitis in humans when digested. The scientists found that these bacteria can spread infection by latching on to calpain, in the cells.

Lead researcher Dr David Brough, who is based in Manchester's Faculty of Life Sciences, said: "We have investigated the growth of *Listeria*, a pathogenic bacterium that grows inside cells. An essential step for its growth, and thus the infection, is the bacteria's ability to move from within one compartment in a cell to another. We discovered that in order for this particular type of bacteria to move and to grow some of the host cell's biology is exploited, a protein called calpain. Without calpain the bacteria cannot move within the cell and so do not grow. This discovery highlights the possibility of using drugs against these host proteins to block infections, potentially reducing the need to use antibiotics."

The study was funded by the global biomedical research charity the Wellcome Trust.



Electron micrograph of a *Listeria* bacterium

"You need each other" writers tell scientists

Six of the UK's top science fiction writers are calling for scientists and the creative community to work more closely together to improve the credibility of fiction.

The University's Geoff Ryman and Dr David Kirby are coordinating efforts to balance scientific practice and knowledge with the demands of story telling.

A letter by writers Ryman, Justina Robson, Simon Ings, Alastair Reynolds Paul McAuley and Ken MacLeod appeared in the influential online arts journal The Manchester Review, published by the University's Centre for New Writing, alongside an essay by Ryman on the topic.

The move came as leading figures in the world of science and the arts gathered in April at the University to discuss how best to guarantee the scientific credibility of fiction, film, television and the arts. Ryman is a leading science fiction writer and creative writing lecturer while Kirby is a senior lecturer in science communication studies at the University's Centre for the History of Science, Technology and Medicine (CHSTM).

The academics believe Britain risks falling behind the United States where organisations such as The Science and Entertainment Exchange have been successfully operating since 2009. The Exchange was developed by the US National Academy of Sciences to increase public awareness, knowledge, and understanding of science through its representation in television, film, and other media.

In 2010, Ryman, who is based at the Centre for New Writing, paired off literary colleagues with scientists — mostly from Manchester — to produce a book of short stories called *When it Changed*. He said: "Getting the correct balance is hard, but worthwhile, because credibility is important to audiences and scientists. This was part of the rationale behind the anthology *When it Changed*. It was about locating what is fresh and new in the sciences and giving writers a chance to work with researchers to come up with different, contemporary themes.

It's my experience that scientists can find it difficult to understand the needs of scriptwriters or storytellers. There is a way of working that ensures that scientific authenticity can be maintained and a gripping story gets told. There is a kind of process that can be followed. But both sides need to be aware of it."

Kirby, is the author of the acclaimed 2011 book *Lab Coats in Hollywood*, which provides a behind-the-scenes look at how scientists assist filmmakers in producing motion pictures. He said: "My research demonstrates how collaborations between scientists and creative professionals can be successful, but the key is to help these communities understand how best to work together."

The Tech Factor and The Bug Hunt

As Part of National Science and Engineering Week two Life Science PhD students, Amelia Markey and Peter Elliott, organised their own events in the Manchester Museum.

The Tech Factor involved following QR code clues around the museum exhibits to find examples of technology. Actors including an ancient Egyptian mummy, a Samurai warrior, polar bears, an astronaut and a palaeontologist were present throughout the treasure hunt to explain various technologies and the impact of these technologies on the environment.

The aim of the project was to engage children with the museum exhibits, to demonstrate how technology has been used in very different ways throughout history and to highlight both the positive and negative impacts of technology.

In the Discovery Centre children and adults took part in The Bug Hunt. Armed with their information packed 'germ books', the room was scoured for hidden pictures of common microorganisms and parasites. Images of ticks, tapeworms and fleas, to name but a few, were hidden around the museum's Discovery Centre allowing the intrepid 'bug hunters' to discover and learn more about them.

Sticker prizes for completion ensured that the room was scoured from top to bottom. The aim of the activity was for the children and adults to learn about common microorganisms and parasites, their effects and the importance of effective hand washing.

This public engagement event was kindly sponsored by the Manchester Beacon, the Manchester Institue for Biotechnology and the Faculty of Life Sciences.

Royal Society Partnership Grant

In June two groups of AS students from Loreto Sixth Form College in Moss Side visited the Faculty. The students performed experiments to identify factors affecting chicken embryo heart development. The visits were part of a project funded by a Royal Society Partnership Grant to Dr Kathy Hentges, Lecturer in Developmental Biology, postgraduate student Becky Brading and Surita Lawes, Head of Science at Loreto College.

In the first part of the project, carried out at the College, enthusiastic Loreto students examined the expression of genes in heart tissue compared to other tissues, using equipment such as a PCR machine bought for Loreto College as part of the £3,000 grant. The second part of the investigation allowed students to design their own experiments to test how the environment can affect chick embryo heart rate.

Whilst at the University, Loreto students also interviewed scientists about their life and research to create a lively podcast for the Loreto College website.

A massive 'thank you' to everyone who made the project possible, and big congratulations to the Loreto College students for carrying out such a successful piece of research.

Nuffield student one of top five young scientists in the UK!

Niall Briggs, an A Level student, undertook a Nuffield Project in the Faculty of Life Sciences which gained him a place in the finals of the National Science and Engineering Competition 2012.

The Nuffield Foundation offer bursaries each year for students in the first year of a post-16 science, technology, engineering and maths (STEM) course to spend 4-6 weeks over the summer working on a research project.

Niall, who is studying at Holy Cross College in Greater Manchester, spent the summer of 2011 in the lab of Professor Kathryn Else investigating the immune response to intestinal worms. Niall said: "In my project I carried out a variety of modern immunological techniques, including immunohistochemistry and other staining methods, but also gained an insight into the world of scientific research and worked at the forefront of immunological research, which for an A level student like me was a fantastic experience."

Niall entered his project for a Gold Crest Award which he achieved, as well as gaining a place in the finals of the National Science and Engineering Competition. Niall was one of only five students out of 360 to be shortlisted for a 'dragon's den' style judging event. The judges included Professor Jim Al-Khalili and Nobel Prize winning biochemist Sir Tim Hunt.

Niall said: "As you can imagine it was a very memorable experience! After an intense few days I was awarded with a 'Highly Commended' in the Senior Science and Maths Category, so I can proudly say I am one of the top 5 young scientists in the UK!"

Niall has since received an offer from Durham University to study Natural Sciences and hopes to go into research afterwards, something he was not considering until completing his Nuffield Bursary.

Faculty Community Open Day

At the end of June the Faculty opened its doors to the public and hosted its second Community Open Day.

The people of Manchester and visitors to the city were invited to get hands-on with maggots, come face-to-face with creepy crawlies, watch robots in action and look through million pound microscopes!

Both children and adults enjoyed the opportunity to make edible cells out of cookies, find out all about DNA by making DNA bracelets and even extracting their own DNA in our laboratories.

The taste test proved popular with children and grown-ups alike, as did discovering how 'good worms' help us develop new drugs.

Faculty scientists talked about their work and were on hand to answer questions and explain how their research affects our every day lives.

Dr Liz Sheffield gave an entertaining talk on 'Science on Film' in which she explained all about the science behind such blockbusters as Avatar and Finding Nemo.

With around 700 visitors, the opportunity to engage with the wider community and demonstrate how the work of the university touches everyday lives proved as popular as ever. " Having open days like these that introduce science to children at a young age and in such a fun way is brilliant" said a parent who attended with two young children. Eight year-old Charlie said "I really enjoyed making cells out of biscuits and sweets, there was a lot to fit on to them".

Let's hope the 2013 open day will be just as entertaining!

Here are just a few photos of the day.

Davina Whitnall shines in Manchester Teaching Awards

Congratulations to Davina Whitnall whose hard work and commitment was recently recognised by Manchester students when she was named the 'Best Support Staff', one of Manchester's Student Union awards.

The award scheme, which is entirely student-led, is designed to recognise and celebrate excellence in teaching, supervision and support across the University. In its inaugural year, the Selection Committee awarded Davina the title 'Best Support Staff' in the Faculty of Life Sciences. This was largely based on the outstanding endorsements from FLS postgraduate students.

Davina was instrumental in setting up, coordinating and supporting the FLS Postgraduate Society. She has also helped the Society to organise a variety of events including the Annual Lecture and the FLS Spring Ball. This is all in addition to her tireless effort in coordinating and organising all the training, public engagement and careers events as well as many social activities for the Faculty's postgraduate students.

Jason Bruce, Director of Graduate Training Programme in FLS said: "Almost every postgraduate student will have come into contact with Davina at some point and will know how she always goes that extra mile. She is truly an exemplary member of staff who thoroughly deserves this award".

Davina, said: "I was taken back when I found out about the Award, I knew nothing about the nomination. It means a lot to me to be nominated by the students and I enjoy working with them on the various Faculty events."

Gary Porteous receives Distinguished Achievement General Award from University


From L to R: Arthur Nicholas, Rita Newbould, Gary Porteous, Renee Holland, Louise Hewitt, Simon Merrywest

After more than forty years at The University of Manchester, Gary Porteous has been awarded a Distinguished Achievement General Award. The award recognises the dedicated service that Gary gave to the University throughout his career.

Gary was a Technical Resource Manager in FLS until his retirement in December 2011. He joined the University aged only 16 and worked his way through a succession of roles, learning and developing along the way. During his extensive time at the University Gary saw great changes and was influential in many of them. Gary was always incredibly helpful and prepared to learn – he even got a BSc whilst working part-time. As a result he not only expanded his knowledge, he also supported the work of many colleagues across the Faculty. Gary thrived in the academic environment around him and was always willing to do as much as he could to support cutting edge research and high standards of teaching.

Access to a wide spectrum of opportunities inspired Gary to keep learning and trying new things. He relished a challenge giving him the impetus to get involved in new and exciting projects and exercise his problem solving skills. Unfazed by change, Gary loved watching new ideas develop into fruition, reinforcing his "have a go" attitude.

When asked about his lasting memories of the Faculty, Gary said: "What I remember are the people – the people and their passion really make the University what it is today. I have been lucky enough to be able to pass on what I have learnt and have relished the opportunity to act as a mentor, train staff and where possible bring out the best in others". Gary derived great satisfaction from watching young technicians flourish as their skills and confidence developed and there are a good many individuals that have Gary to thank for the success that they have gone on to enjoy.

Gary is now looking forward to spending some time travelling; following a trip to Australia earlier in the year he intends to visit Canada, India and the Galapagos islands. In the meantime he is conscientiously honing his musical skills and learning the piano. We wish him all the very best.

Editor's Note:

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

Lisa Govey
Faculty Communications Officer
Tel: 0161 275 5765
Email: lisa.govey@manchester.ac.uk

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

www.manchester.ac.uk/lifesciences

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