

MANCHESTER
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The University of Manchester

Faculty of Life Sciences

Newsletter

Issue 26, Graduation Edition, Summer 2013

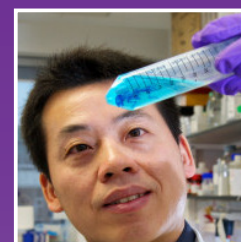


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Message from Associate Dean for Teaching, Learning & Students



Manchester, our students experience a huge range of other opportunities; some of these involve developing new skills, gaining work experience, getting a stronger CV – and some are just about having fun.

Many of our students choose to continue with their studies before tackling the job market. This year's cohort have been exceptionally successful at landing postgraduate research positions, in world-class institutions both in the UK and across the globe – destinations this year include Nevada, Liverpool, Oxford and Nagoya, Japan. We look forward to hearing from you and reading about your research.

In the past year we have turned our focus on a strange word with very important implications: employability. The year started with an event involving all our Degree Programme Directors and a group of graduate employers who were quizzed on how best we can prepare our graduates to appeal to top employers. That led into a series of careers-focussed events for students, including a speed-networking event at which alumni talked to final year undergraduates and recent graduates about their jobs and career paths. If any of this year's graduates don't yet have a job, they would be well advised to join our alumni

association (see www.manchester.ac.uk/alumni – click on update your details and fill out the form to join) and look out for the invitation to join us at this November's event!

In March, a number of our four-year degree students, whose degrees are "with Industrial/Professional Experience" or include a year of research in a different language, were kind enough to spare time to meet with a panel from the Society of Biology to help us obtain accreditation of our four-year degrees. The Society of Biology is the leading UK voice for biology, and its accreditation 'highlights the degrees that have the potential to educate the life science leaders and innovators of the future'. The visiting panel from the Society reported that our "outstanding students" did us proud and contributed to the most enjoyable part of their day with us. This confirms what we already know – graduates from Life Sciences are among the best.

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

Congratulations to all our 2013 graduates on their achievements. They have succeeded in their academic studies and are leaving us with a University of Manchester degree, which we know is highly regarded across the world. But there is much more to university than academic work. During their time in

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.

Faculty of Life Sciences (Alumni Relations)
Room G.483, Stopford Building
The University of Manchester
Oxford Road
Manchester
M13 9PL

email: alumni.lifesciences@manchester.ac.uk
tel: +44 (0) 161 275 1531
www.ls.manchester.ac.uk/schoolsandcommunity/alumni

Alumni Association

Register with Your Manchester Online now and become a 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.



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FLS Outstanding Alumni Awards

During the last academic year, we have made two Outstanding Alumni Awards. These are given to former students who have achieved distinction within their profession, have provided exemplary service to the University, or have made an outstanding contribution of a humanitarian nature.

Duncan Casson

Dr Duncan Casson is one of the UK's most respected developers of biological medicines.

A native of Denton – and named after Manchester United's famous 'Busby babe' Duncan Edwards – Duncan moved to Plymouth with his family when he was nine.

He returned to Manchester nine years later as a student, graduating in 1980 with an honours degree in Biochemistry.

Following a doctorate in Microbiology and Biochemistry at Birmingham University, Duncan spent three years as a researcher in biochemical engineering. He quickly realised, however, that his real passion was in turning research into applications that improved lives. He therefore left academia and over the next 15 years worked at two of the most respected names in international biochemistry – Genzyme Corporation and Cambridge Antibody Technology – developing innovative new products that enhanced the quality of life for people all over the world.

Perhaps his biggest success, however, is his most recent one. In 2005 Duncan set up a small biotech company, PanGenetics UK, to develop therapeutic antibodies targeting Crohn's disease and chronic pain. Within five years he took PanGenetics from start-up to one of the most talked-about names in biochemistry, having successfully developed a new therapeutic antibody to ease the plight of millions of sufferers of chronic pain. After considerable international interest, in 2010 PanGenetics was sold to American biotech giant Abbott Labs for US\$190 million. Since the sale, Duncan has been advising a number of biotech companies on developing new therapeutic biological products.

Most recently, he was appointed Chief Development Officer of a rapidly growing biotechnology company near Cambridge. He represents the sort of drive, enthusiasm and willingness to innovate that we want to foster in the current generation of students.



Jackie Caine

Jackie Caine graduated only in 2006, but in those few years she has made a remarkable impact. Jackie was the first in her family to attend university and her career shows how graduates can have a series of exciting and fulfilling jobs if they are flexible and seize their opportunities. After graduating with a 1st Class honours degree in Zoology, Jackie took on temporary jobs in order to fund a trip to Kenya where she worked with The Colobus Trust, a charity that conserves wild colobus monkeys and local primate populations along the Diani coastline.

On her return from Africa, Jackie worked for the Society for Education and Exploration, and for Chester Zoo and eventually found a job with the Bat Conservation Trust in London. She realised that she needed to develop her academic skills, and was awarded a grant to study for a Masters in Conservation at University College London. During her masters, Jackie was an intern for Wildlife and Countryside Link – an umbrella group of UK wildlife organisations – which gave her experience of environmental lobbying and policy work.

Jackie is now a Senior Science Policy Officer at the Society of Biology, and has given evidence on forestry research to a joint meeting of the parliamentary Science and Technology Committees. She currently works on providing an evidence base for policy developments across the Biological sciences, such as skills development, research funding and equality and diversity issues.

More recently, Jackie has helped set up 'Groho' – a non-profit limited company that will make urban greening solutions more accessible to urban communities, from large companies to small community projects. The projects will be centred around Soho square in the centre of London, bringing together landscape designers, architects, garden designers, artists and scientists to make the capital a showcase for urban ecological design and sustainability.

In seven short years following graduation, Jackie has done an amazing amount. This year's students can take her career as an inspiration – the world is full of opportunities.

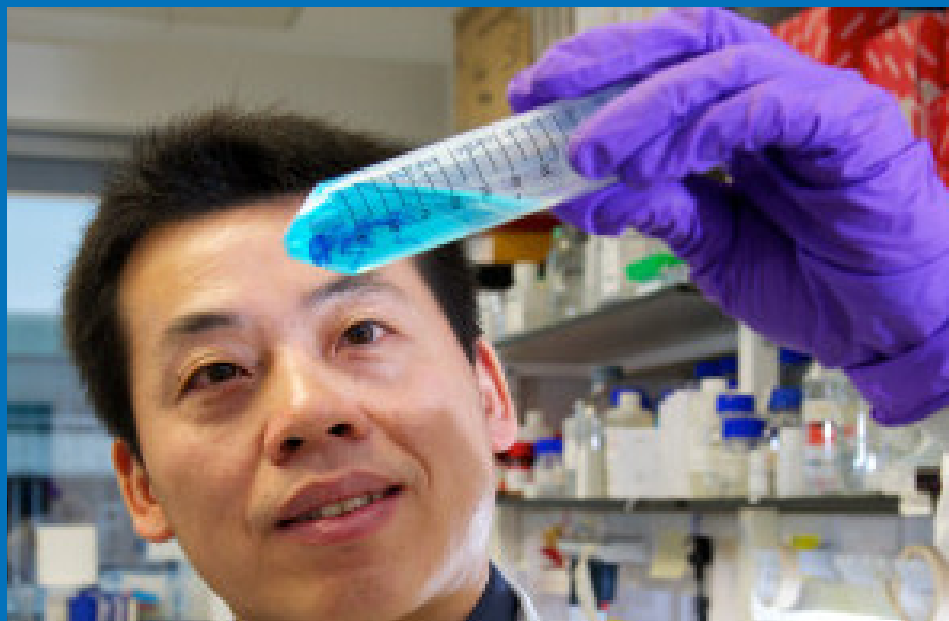
New research links body clocks to osteoarthritis

Scheduled exercise, regular meals and the periodic warming and cooling of joints could be used to relieve the symptoms of osteoarthritis, find Faculty researchers

A research team from the Faculty of Life Sciences has shown that cartilage cells have a functioning 'clock' that affects genes controlling tissue function, switching them on and off. The rhythm of the cartilage clock may explain why osteoarthritis sufferers find the symptoms of the disease worse at certain times of the day.

Team leader Dr Qing-Jun Meng studied cartilage tissue in mice and found that the tissue's body clock was 40% weaker in older mice. This suggested that clock deterioration could contribute to the increased risk of developing osteoarthritis in later life. The researchers then looked at cartilage cells affected by damage similar to osteoarthritis and found that components of the body clock are altered during the early stages of the disease.

To see if there was a causal link between these changes, the team imposed an artificial rhythm on mouse and human cartilage cells, mimicking daily changes of body temperature. After three cycles of temperature changes, the body clock in the cells had been reset and was more efficient. This change lasted up to seven days after the temperature cycles were removed and may continue for longer.



Dr Meng says: "By imposing a rhythm to boost the internal rhythm in cartilage, our data suggests the aged cartilage clock might be re-tuned. This could be done by scheduled exercise, restricted meal times or by targeting the joint itself with scheduled warming and cooling. Imposing a rhythm could have a significant impact on the future management of joint diseases and could help relieve sufferers' symptoms. Taking drug treatments for joint diseases according to the cartilage clock time could increase their

effectiveness, which would allow a lower dosage and consequently reduce side effects."

Dr Meng and his team have now been awarded an MRC grant of £500,000 to establish the causal relationship between clock disruptions and the onset and severity of osteoarthritis as well as identifying novel therapeutic targets. This will include the targeting of clocks by imposing an artificial rhythm as well as the timed delivery of drugs.

Ancient Egyptian cosmic accessories

Manchester researchers help prove that Ancient Egyptians used meteorites to make symbolic accessories

In 1911, tube-shaped iron beads dating from 3350 to 3600BC were excavated from the cemetery at Gerzeh, a burial site approximately 70km south of Cairo. These beads are the earliest example of iron use by the ancient Egyptians. The nickel-rich iron they are made from is typical of meteorites, and this was initially assumed to be the source of the metal. However, in the 1980s historians suggested that early attempts to process terrestrial iron ore might have led to this unusual composition, and an outer space origin of the beads was ruled out.

Manchester Museum holds one of these beads in its collection, and it was recently lent to the University's School of Materials and to the Open University (OU) for testing. Researchers used a combination of the OU's electron microscope and Manchester's X-Ray CT scanner to demonstrate that the nickel-rich chemical composition of the bead is indeed typical of



a meteorite. The iron in the bead came from outer space!

OU Project Officer Diane Johnson, who led the study, said: "This research highlights the application of modern technology to ancient materials not only to understand meteorites

better but also to help us understand what ancient cultures considered these materials to be and the importance they placed upon them." Meteorite iron had profound implications for the ancient Egyptians, both in their perception of the iron in terms of its celestial origin and in their early attempts to master metallurgy.

Co-author Dr Joyce Tyldesley, a Senior Lecturer in Egyptology in the Faculty of Life Sciences, said: "Today, we see iron first and foremost as a practical, rather dull metal. To the ancient Egyptians, however, it was a rare and beautiful material which, as it fell from the sky, surely had some magical/religious properties. They therefore used this remarkable metal to create small objects of beauty and religious significance which were so important to them that they chose to include them in their graves."

'Analysis of a prehistoric Egyptian iron bead with implications for the use and perception of meteorite iron in ancient Egypt,' is published as an open access article in *Meteoritics and Planetary Science*.

Collagen fingerprints reveal giant Arctic camel



A Canadian research team, helped by scientists at the Manchester Institute of Biotechnology, has discovered the first evidence of an extinct giant camel in the Arctic.

Mysterious 3.5 million year old bone fragments were found by Dr Natalia Rybczynski, a vertebrate palaeontologist with the Canadian Museum of Nature. To discover which species they came from, FLS scientist Dr Mike Buckley employed a pioneering new technique called "collagen

fingerprinting". He extracted minute amounts of collagen from the fossils and used chemical markers for the peptides that make up the collagen to develop a collagen profile or fingerprint. He found that the profile from the mystery bones was almost an identical match to the modern day dromedary as well as the extinct Yukon giant camel that lived in the ice age.

Dr Buckley said: "This is the first time that collagen has been extracted and used to identify a species from such ancient bone

fragments. These results show the huge potential of collagen fingerprinting to better identify extinct species from our preciously finite supply of fossil material."

Dr Roy Wogelius from the School of Earth, Atmospheric & Environmental Sciences analysed the mineral content of the bones. His findings suggest that mineralization worked along with cold temperatures to help preserve the proteins in the bones.

Rhino baby boom

Ground-breaking science by Chester Zoo and the University has helped create a rhino baby boom

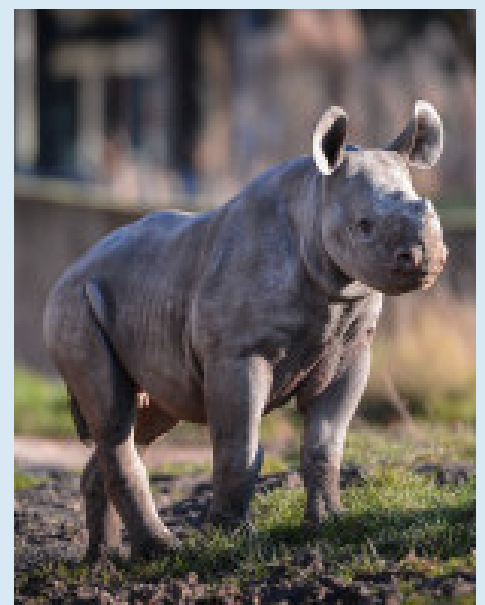
For ten years there were no baby rhinos born at Chester Zoo, but in the last four years there have been four births. The latest baby to be born was a female called Dakima. She was born on March 7 2013 to mum Malindi and 13 year old dad Magadi. This baby boom is all due to a collaborative project between the Zoo, the Faculty of Life Sciences and the University of Liverpool. It has involved PhD student Katie Edwards spending every day analysing rhino dung.

Katie explains: "Hormones associated with reproduction can be measured in an animal's urine and faeces. So our keepers regularly bring dung samples from each of our female rhinos over to our lab for testing. We then break it down and extract all sorts of hormonal indicators."

The project was devised in 2007 by the zoo's Scientific Manager, Dr Sue Walker, together with Dr Susanne Shultz who is now at the Faculty of Life Sciences.

Dr Shultz is delighted with the success of the project: "Although collecting rhino dung isn't the most glamorous work, this project is an excellent example of how academics can collaborate with conservation organisations to save endangered species. Getting a large number of zoos across Europe to contribute to science has been very exciting."

The team is now working with zoos throughout Europe and say that their methods could transform the success of captive breeding programmes for this critically endangered species. Fewer than 650 now remain in the wild.



Distinguished Achievement Awards

The achievements of some of the University's most outstanding staff and students have been recognised with prestigious awards. The Distinguished Achievement Awards were launched in 2005 to highlight the best and the brightest talent within the University. The Awards honour staff whose research has broken new ground or whose teaching has been outstanding. They also recognise undergraduates who have made an important contribution to the life of the University or post-graduates who have performed exceptionally well.

The FLS winners of this year's awards were:

Teacher of the Year –
Dr Richard Prince

Researcher of the Year –
Professor Nancy Papalopulu

Undergraduate Student of the Year –
Mezida Bedru Saeed

Postgraduate Student of the Year –
Nicholas Love

The President and Vice-Chancellor presented the winners with their medals at a special ceremony and lunch on Friday, 28th June 2013.

Teaching Excellence Awards

• The University Teaching Excellence Awards recognise academics who have demonstrated a significant and sustained commitment to excellence in teaching. These awards are highly prestigious and the field is extremely competitive. Dr David Kirby of FLS received one of the five awards presented across the University.

• Professor Liz Sheffield was nominated by FLS for the Higher Education Academy Bioscience Teacher of the Year Award hosted by the Society of Biology. Liz was one of five finalists shortlisted for the award.

• Amit Jinabhai has been shortlisted as 'Lecturer of the Year' by the Association of Optometrists after being nominated by Optometry students. All the lecturers on the shortlist will be profiled in *Optometry Today*

magazine over the coming months and the winner will be announced in November.



Dr Richard Prince

New ways of teaching and learning

Up until a few years ago, University teaching had not changed for centuries. Lecturers lectured while students took notes. Now there are a wide range of electronic tools that enhance teaching and learning. All of our courses are on Blackboard, the University's 'virtual learning environment'. Many of these courses have interactive quizzes and games, often created by final year undergraduates as part of their projects. Here are just a few examples:

Fay Mook, in her project with Dr Reinmar Hager, developed an iPad application about

the birds that can be seen on the first year field course to South Africa. Students can scroll through a list of birds, play their calls and thus identify them. For each bird species there is a short entry on its distribution, habitat, taxonomy, breeding and behaviour, illustrated with several pictures, and some additional quizzes.

Anna Maehr worked with Dr Deborah Talmi to find out why some people in the UK have negative views about wind turbines. They are the first researchers to have used psychophysiological measurements to measure emotional



responses to pictures of wind turbines. They found that the more people know about renewable energy, the more positive they are about wind turbines. This finding is currently attracting interest from the BBC.

Chris Bower, working with Dr Donald Ward, designed an on-line scenario-based 'clinic' to support a practical class on analysing blood and urine samples. After measuring the student's knowledge, the scenario then tailors the teaching to what the student needs to know, before offering a final test. None of this involves 'dumbing down' – the scenario warns the student: 'Do not worry if you find it hard, that is the point!'

These projects enable students learn how to work with new technologies, help staff to enhance their teaching, and provide the next generation of undergraduates with an experience that would have been unimaginable to their predecessors in past centuries.



CJ and the SharkLab

CJ Crooks graduated in 2012 with a BSc in Zoology. He spent his placement year in the Bahamas, working at the Bimini Biological Station Foundation 'Sharklab.' Sharklab is a non-profit organisation offering internships and placements to people interested in shark research and ocean ecosystem conservation. They have published scientific papers, appeared in TV shows, films, and documentaries, and they possess the largest genetic database of a single shark species in the world.

After graduating, CJ returned to the Bahamas as the Media Manager of the Bimini Biological Field Station. He is the primary contact for every TV or film production that they host and is redesigning their website. His role makes scientific research accessible to the public – he currently organises a course focusing on shark biology and ecology which is open to anyone over 18 and he runs research experiences for people who are unable to commit long-term or are too young to volunteer.

The most exciting element of the role is his involvement in research: whether tagging a free swimming great hammerhead or catching a 12 foot tiger shark, no two days are the same.

CJ told us:
"I'm living the dream right now. I learn and see new things every day and live on an idyllic Caribbean island. None of this would've been possible without the Faculty; the opportunities provided were

second-to-none and shaped my prospects as a graduate. I highly recommend the placement year; it helped me to realise my passions and dreams."

See CJ's fantastic photos on his website: www.cjcrooks.com



All photos © CJ Crooks

Combining biology and professional rugby



Some students are not only academically minded, they are also elite athletes. To help them balance their elite sport with their academic work, the University has a Sport Scholarship Scheme. This year one of our Sports Scholars was professional rugby union player Charlie Amesbury. Charlie spread the final year of his biology degree over two years so he could play on the wing with Sale Sharks rugby union club –including four days a week training. The result was that Charlie has just graduated with a 2:1 in Biology.

Charlie's final year research project involved studying the biological clocks of professional rugby players – including members of the England squad. His supervisor, Professor Andrew Loudon, is a world expert on biological clocks and a keen Sale Sharks fan, so it was a perfect match. Charlie was able to show that as well as being extremely fit, professional rugby players show unusually well-synchronised biological clocks, and are able to be more active earlier in the day than non-rugby playing young men of a similar age. Professor Loudon hopes to publish the research, while Charlie is taking his professional rugby career – and his degree in Biology – to Bristol Rugby Club.

STOP PRESS: In recognition of his remarkable efforts in combining sport and academic achievement, it has just been announced that Charlie has been awarded the Faculty's Outstanding Achievement Award.

A tribute to Dr Derek Yalden

Derek Yalden receiving his medal at the Linnean Society in 2010. Copyright Linn. Soc



Dr Derek Yalden, Honorary Reader in Zoology in the Faculty, died on 5 February 2013, aged 72. Derek joined the University in 1965 as a lecturer and retired in 2005. Derek was a world expert in British mammals, present and past. From 1980-1992 he was the Editor of *Mammal Review*, and from 1997 until his death he was the President of the British Mammal Society. The importance of his research career was shown in 2010 when he received the Linnean Society Medal, marking a lifetime's study of vertebrates.

As well as co-editing *The Handbook of British Mammals*, Derek was the author of two popular books – *The History of British Mammals* and *The History of British Birds* – and the co-author of *The Lives of Bats*. He also became fascinated by the animals of Ethiopia, making major contributions to the study of Ethiopian wildlife.

Derek lived in the Peak District, which was also the centre of an important part of his research. He was renowned in both the scientific literature and in the media as the man who studied the Peak District wallabies (they were released from a private zoo during the war, and now appear to be extinct).

His love for the Peak District also led him to study how humans use the National Park, and the effect of increased tourism and land erosion on the wildlife in the area, in particular on Kinder Scout. This research led to changes in path development in order to help the growth of plants and the success of ground-breeding birds. Derek's influence on thousands of Manchester students was enormous, and those lucky enough to go on a field course with him will never forget his knowledge and generosity.

Derek's work lives on, not only in his students who have such fond memories of him, and in the legacy of his publications, but also in Ethiopia, where the tree-frog *Leptopelis yaldeni* and *Desmomys yaldeni* (also known as Yalden's rat) have been named after him. We send our condolences to his wife Pat, who was with him in the Forest of Dean when he died.

The Faculty has set up a Derek Yalden Fund to enable alumni and friends to mark his memory by providing financial support to students going on field trips. If you were taught by Derek, you will know what a unique and inspiring person he was. To donate, visit www.manchester.ac.uk/derekyaldenfund

New popular science books by FLS staff

Leech by Robert G. W. Kirk and Neil Pemberton (Reaktion, January 2013). In this book in the prestigious 'Animal' series, Rob and Neil describe the biology and the cultural history of the leech. Spanning medicine and popular culture, Nobel prizes to Dracula, Leech shows how, as a horror and a healer, the leech has reared its head in many unexpected places and practices. It is among humanity's most enduring and peculiar companions.

The Compatibility Gene by Dan Davis (Penguin, August 2013). Dan shows how the 'compatibility gene' – a cluster of genes involved in our immune response – is radically transforming our knowledge of the way our bodies work, and is having profound consequences for medical research and ethics. Looking to the future, he considers the startling possibilities of what these wondrous discoveries might mean for us all.

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Editor's Note:

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

Natalie Liddle
Faculty Communications Officer
Email: natalie.liddle@manchester.ac.uk

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

Designed by the Faculty of Life Sciences PhotoGraphics Unit
www.manchester.ac.uk/photographics

Front cover: Worker bee on flower by Emily Walker.
The photo was the winner of the 2013 FLS Student Photo Competition.