

Faculty of Life Sciences Newsletter

Issue 22, Spring 2012

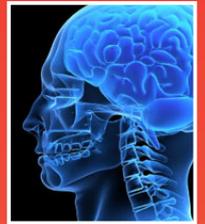
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New Inflammation
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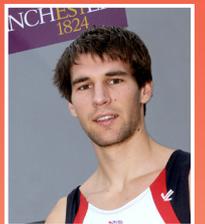
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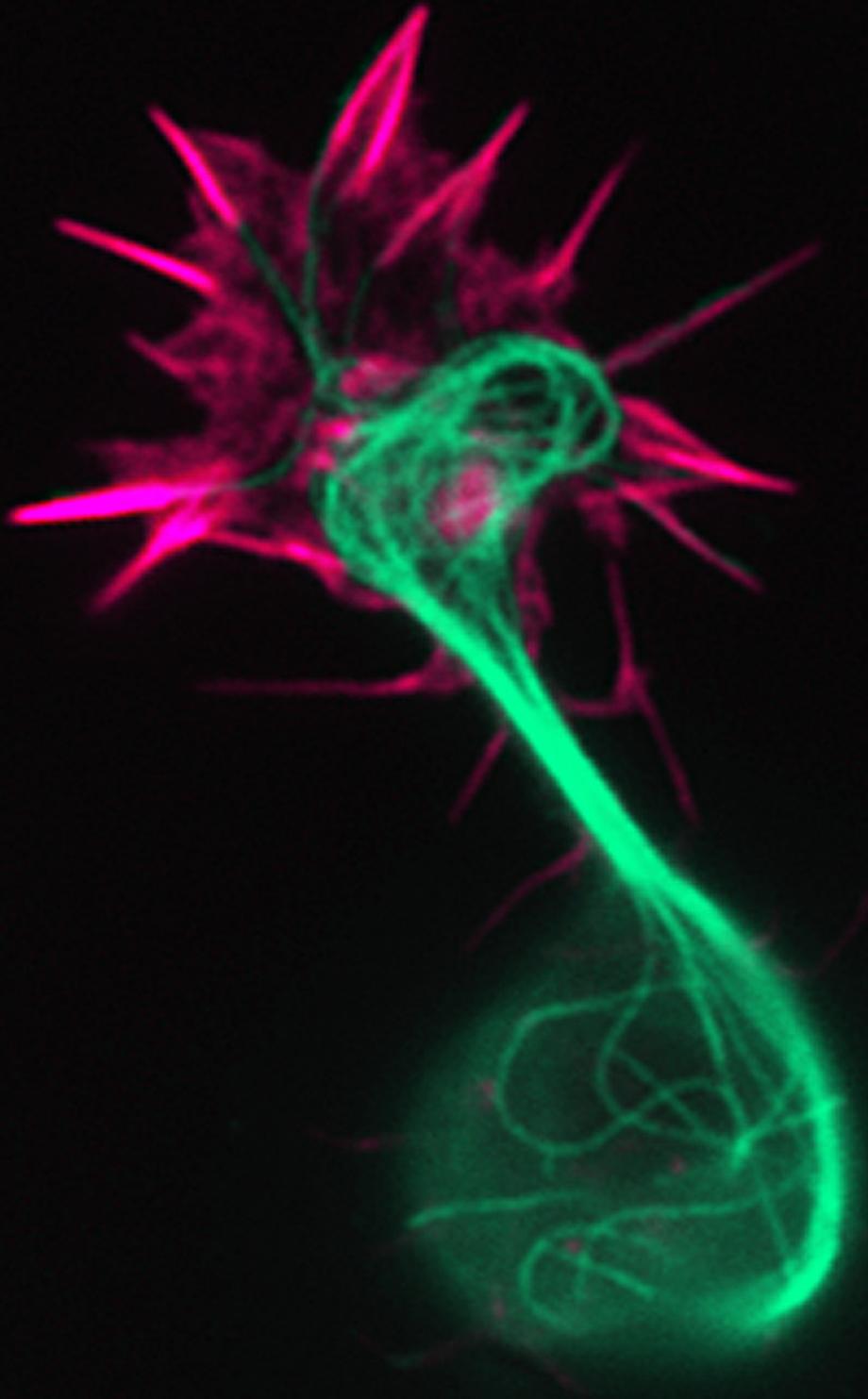
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“A neuronal growth cone sets out on its journey”
Robin Beaven

Director appointed for new Inflammation Research Centre



The University, GlaxoSmithKline and AstraZeneca have appointed Professor Tracy Hussell as Director of the new Manchester Collaborative Centre for Inflammation Research (MCCIR).

The MCCIR is a unique collaboration, announced in May last year, which will establish a world-leading translational centre for inflammatory diseases. There is an initial investment of £5 million from each partner over a three year period.

Professor Hussell is currently Professor of Inflammatory Disease at the National Heart and Lung Institute at Imperial College London. She has developed a vibrant research group studying immunity, pathology and vaccination in influenza virus infection, with a special interest in the secondary bacterial complications that can ensue. Her research has identified novel strategies to alleviate inflammatory disorders. Her group has pioneered the concept of, and is still working on, how one inflammatory condition modulates the severity of the next.

Importantly, she has identified that the activation of an immune response changes depending on which organ of the body it is in.

Professor Hussell said: "This new centre provides a unique opportunity, working not only with the academic and medical resources of Manchester University, but also with the pharmaceutical industry. I am very proud to have been chosen to lead the centre and, naturally, I am hugely excited by the prospect of guiding it into a world leading institution for translational research and innovation".

The MCCIR collaboration will bring together scientists from both the pharmaceutical industry and academia to work collaboratively on inflammation research and translational medicine.

Professor Martin Humphries, Vice-President and Dean of the Faculty, added: "The MCCIR will deliver ground-breaking basic and translational research in inflammation and inflammatory disease. The initiative therefore requires someone with Tracy's track record, vision and drive to succeed, and I am delighted that she has agreed to join us to lead the Centre."

Professor Hussell is a principal investigator in the Medical Research Council/Asthma UK Centre in Allergic Mechanisms of Asthma, and in the Centre for Respiratory Infection. She is also a member of the research committee for Asthma UK and has contributed significantly to British Immunology as Secretary for the Clinical Immunology and Allergy Section of the Royal Society of Medicine and as the Education Secretary and a Trustee of the British Society for Immunology.

Manchester Histories Festival

The second Manchester Histories Festival, a ten-day programme of public talks and activities, featured a strong contribution from the Faculty's Centre for the History of Science, Technology and Medicine (CHSTM) – appropriately, as the Festival was originated by CHSTM's Professor John Pickstone in 2009.

Michael Worboys presented his research on the history of dog-breeding, focusing on three very different forms of canine life: the Lyme Hall mastiff, the Manchester terrier, and the street dogs of the nineteenth-century city. James Sumner surveyed some notable developments in Manchester's computer culture, from the 1940s to today – a story which includes the legendary Alan Turing. In the Town Hall, meanwhile, CHSTM Research Associate Jo Baines looked after the CHSTM display stand with help from volunteer staff and students, answering visitors' queries and handing out materials including our tour guide to Manchester as experienced by the nineteenth-century chemist John Dalton.

Plans are afoot to establish the Festival as a regular biennial event, so stay tuned for news of CHSTM's contribution in 2014

Details of CHSTM's public events are regularly published on our website at www.manchester.ac.uk, and on Twitter @ManCHSTM.

University Excellence Award for FLS's Dr Anil Day



Congratulations to Dr Anil Day who has been awarded the University's Teaching Excellence Award for 2011-2012. This award recognises excellence in teaching and in Dr Day's case for his work on the innovative MSc in Biotechnology and Enterprise degree programme. Dr Day developed the programme in 2008 with the aim of providing students with the experimental skills and knowledge to undertake scientific research, combined with training in the entrepreneurial and business skills needed to convert scientific discoveries into

inventions and commercial products. Dr Day says, "FLS provided a particularly fertile environment to develop this unique course due to the breadth of research undertaken, and the large number of staff with industry-links. Ultimately, the success of the course reflects the high calibre of our talented students who have embraced the training and vision provided by the course to carve out careers in the global biotech industry." Since inception the programme has attracted gifted students from countries

around the globe including Chile, China, India, Lebanon, Mexico, Namibia, Nigeria, Oman, Pakistan, Spain and Taiwan. The students are united by a common interest in research of international quality, and the entrepreneurial and business skills provided by our international MSc degree programme. Whilst the degree has only been running for three years, alumni are already progressing to senior positions in the commercial sector.

Dr Day says, 'Support for the course has been terrific and a large number of people have contributed to its success, especially Maggy Fostier and Martin Henery (Business School) who hone the students entrepreneurial skills for a business pitch to potential investors in the 'Lions Lair'. Leopoldo Herrera Rodriguez graduated in 2011 and works in a biotech company. He says, 'This course can be as useful as you want it to be. There is the business aspect for those who want to be entrepreneurial and there is the science aspect which can be equally thrilling.'

Science Ethics Institute to join in addressing research grand challenges

The University's Institute for Science, Ethics and Innovation (ISEI), established in 2008, is to join the Faculty of Life Sciences from August 2012. iSEI's move underlines the Faculty's commitment to conducting high quality research that has broad social and economic relevance and impact, and will help to further develop a new overarching field of academic study in 'Science Ethics', which is at the core of the Institute's work. Distinct from the more traditional subject of the Philosophy of Science and the more specific disciplines of Bioethics or Research Ethics, Science Ethics is important today owing to the truly interdisciplinary and global nature and impact of scientific research.

Chaired by John Sulston (Nobel Prize for Physiology/Medicine 2002), who is currently leading the Royal Society's study on 'People and the planet', iSEI is directed by John Harris, a bioethicist and philosopher who regularly appears in the media to discuss current dilemmas associated with the advancement of science. Other members of the group are Deputy Director Sarah Chan, who is already closely involved in developing and delivering teaching and training in science ethics within FLS, researchers Catherine Rhodes, Amel Alghrani and John Coggon, and research manager Catherine Spanswick.

The work of iSEI is conducted within the context of current and future trends in the life sciences, and involves 'bench-scientists' as well as those with backgrounds in ethics, law, philosophy and governance. An

DAcademy of Medical Sciences Fellows (L-R) Nik Rose, Veronica van Heyningen, Martin Bobrow and John Harris, pictured with Chair of the 'Human bodies: animal bodies' public panel, Sarah Chan (centre)



excellent example of its approach is iSEI's recent public panel on 'Human Bodies: Animal Bodies', an event co-organised with the Academy of Medical Sciences (pictured above). Other examples of projects that offer excellent opportunities for collaboration within the faculty include those in neuroscience, stem cell biology, reproduction, biosecurity and biofuels.

Another major theme of iSEI's work – 'Who Owns Science?' – asks fundamental questions about the ownership, control and direction of science and the motivations for doing science and funding science. The Institute has a book series on 'Science

Ethics & Society' with the open-access publisher Bloomsbury Academic, with titles including International Governance of Biotechnology and Scientific Freedom. The planned alignment of iSEI alongside the Faculty's Centre for History of Science, Technology and Medicine will also build the Faculty's capacity under the broad theme of 'Medical Humanities'.

To find out more about the work of iSEI visit www.manchester.ac.uk/isei or contact catherine.spanswick@manchester.ac.uk.

Investment in Postgraduate training

The Minister for Universities and Science, David Willetts, recently announced £67 million of new investment in postgraduate training and development in the biosciences - including £6.3 million for The University of Manchester.

The investment, from the Biotechnology and Biological Sciences Research Council (BBSRC), includes support for 14 Doctoral Training Partnerships (DTPs) across the UK as well as a number of industrial CASE (iCASE) studentship awards. The University of Manchester was awarded a single institutional DTP and will get 21 students a year over the three years. These students will be registered in the Faculty of Life Sciences, the Faculty of Engineering and Physical Sciences or the Faculty of Medical and Human Sciences.

The DTP programme will provide highly skilled scientists for academia, policy and industry and support the BBSRC mission to further scientific knowledge for economic growth, wealth and job creation - improving the quality of life in the UK and beyond.

The DTP in Manchester represents a new, more strategic approach from BBSRC to train highly skilled scientists for the UK research base and will produce scientists with the training to meet major social and economic challenges in food security, sustainable bioenergy and renewable materials and improving lifelong health and wellbeing, as well as supporting those undertaking research in core underpinning bioscience.

An innovative and integral element of the programme, built in to enhance the employability of the DTP students, is the requirement for them to undertake a three-month professional internship outside of the lab to widen their experience of the areas of work in which they can apply their PhD skills and training. Students could undertake these internships in policymaking, media, education, industry or elsewhere.

The DTP funding allows us to recruit the best students and secure additional funding from other sources, such as

industry or charities, to increase the impact of public investment. The DTPs have been awarded by BBSRC following a competitive process including assessment by BBSRC's independent Training Awards Committee; staff within the Faculty of Life Sciences co-ordinated our successful bid for the DTP. Particular thanks go to Professor Cathy McCrohan and Dr Anna Lawless who co-ordinated the submission of the bid.

Recruitment is now well underway for students commencing their PhD in September 2012. The Faculty expects to receive a significant proportion of the studentships and aims to provide an excellent research environment and co-ordinated training programme over the duration of the award.

See: www.manchester.ac.uk/dtpstudentships
<http://www.bbsrc.ac.uk/dtp>

Human skull study causes evolutionary headache



Scientists studying a unique collection of human skulls have shown that changes in skull shape, thought to have occurred independently through separate evolutionary events, may in fact be linked.

Evolution has led to a significant change in the shape of our faces compared to those of our ape-like ancestors. Our spinal cord enters the skull further forward than in the ape, facilitating upright motion, the top portion of our skulls are larger and more rounded to accommodate a larger brain and our faces have flattened, perhaps driven by the development of language. Anthropologists have previously thought that such changes occurred independently. However, researchers from the Faculty and Barcelona have uncovered evidence suggesting these structural changes may instead be linked.

Researchers studied 390 skulls from the Austrian town of Hallstatt, where tradition

dictates that following burial, bones are removed and stored separately, making room for future burials. Once removed, skulls are decorated and, importantly, bear the name of the deceased. This allowed researchers to identify individuals through church records and ultimately investigate the inheritance of skull shape. Using both genetic and structural analysis, researchers found that the features of these skulls vary together, meaning that changes in one structure cause changes in other structures. These findings indicate that the human skull may have evolved as a whole, rather than as a number of separate evolutionary events. FLS researcher Dr. Klingenberg, one of a team of scientists behind this work, said that these findings are intriguing and appear to tell a different story to some fossil records, meaning we may have to re-think our current understanding of human skull evolution.

Anti-inflammatory chemical could prevent stroke damage



Faculty scientists have found a potential treatment for brain injury and stroke. The treatment works by reducing the damaging effects of inflammation. Unfortunately many existing anti-inflammation drugs cannot pass through the barrier that exists between blood vessels and the brain. Until recently it was thought that the naturally occurring chemical IL-R1a - which is already used to treat rheumatoid arthritis - could not pass through this barrier either.

But Professor Nancy Rothwell and her colleagues have shown that the IL-R1a can pass into the brain and protect it from inflammation. IL-R1a works by limiting the inflammatory damage caused by a molecule called interleukin 1. 'IL-1Ra is a safe and effective treatment,' Professor Rothwell said.

The drug is currently in Phase II clinical trials and has shown promise in the treatment of stroke patients. IL-R1a is also a possible candidate treatment for diseases that involve long term inflammation of the brain like Alzheimer's, Parkinson's and multiple sclerosis.

Body clocks may hold key for treatment of bipolar disorder

FLS Scientists have gained insight into why lithium salts are effective at treating bipolar disorder in what could lead to more targeted therapies with fewer side-effects.

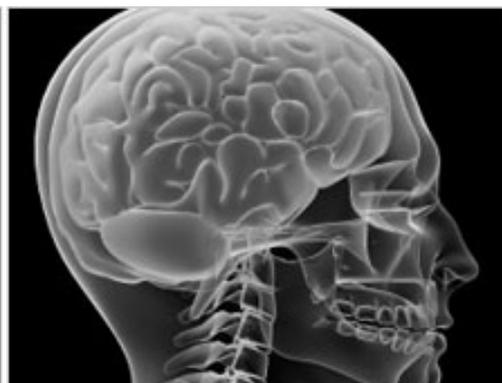
The extreme 'mood swings' in bipolar disorder have been strongly associated with disruptions in circadian rhythms - the 24-hourly rhythms controlled by our body clocks that govern our day and night activity.

For the last 60 years, lithium salt (lithium chloride) has been the mainstay treatment for bipolar disorder but little research has been carried out to find out whether and how lithium impacts on the brain and peripheral body clockwork.

"Our study has shown a new and potent effect of lithium in increasing the amplitude, or strength, of the clock rhythms, revealing a novel link between the classic mood-stabiliser, bipolar disorder and body clocks,"

said lead researcher Dr Qing-Jun Meng, in the University's Faculty of Life Sciences. "Our findings are important for two reasons: firstly, they offer a novel explanation as to how lithium may be able to stabilise mood

swings in bipolar patients; secondly, they open up opportunities to develop new drugs for bipolar disorder that mimic and even enhance the effect lithium has without the side-effects lithium salts can cause."



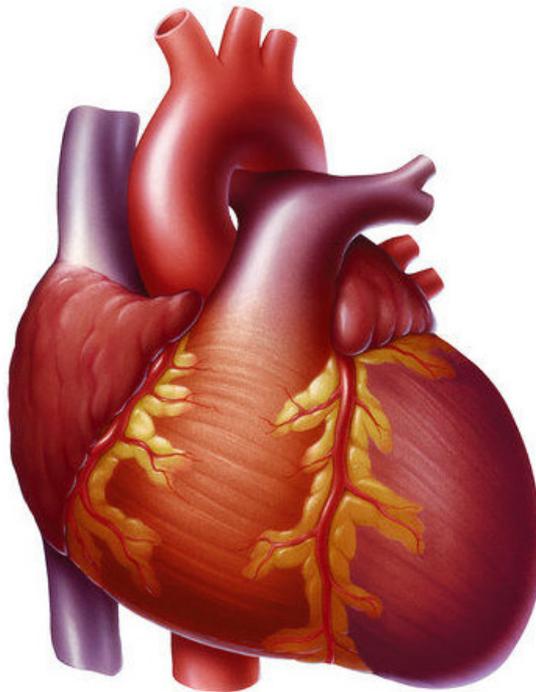
Dual Role for MS Drug in Preventing Heart Failure

A drug used to treat multiple sclerosis may also be effective in preventing and reversing the leading cause of heart attack, a new study has found.

Our scientists have found that in tests, a drug called Gilenya, which is used for treating MS, was able to reverse a potentially lethal heart swelling known as ventricular hypertrophy.

The ventricles are the chambers in the heart responsible for pumping blood to the lungs (the right ventricle) or to the body (the left ventricle). In response to increased activity or pregnancy, these ventricles swell to accommodate the increased need for oxygenated blood. However, sustained pressure on the heart due to stresses or diseases can cause permanent swelling of the ventricles ('ventricular hypertrophy') and this can lead to cardiac arrest.

The study looked at the effect Gilenya has on a naturally occurring enzyme in the body, called Pak1. The drug enhances the activity of the enzyme, allowing it to transport anti-swelling factors to the ventricles more effectively. Study co-author Dr Xin Wang, a Lecturer in Molecular Cardiology at the University of Manchester, said: "Our research had previously identified the effect of Pak1 in preventing tissue damage caused by reduced blood flow to the heart. This latest study used a genetic modification of the Pak1 gene to show how the enzyme, when stimulated by Gilenya, prevented and even reversed the symptoms of ventricular hypertrophy."



The research, led in Manchester by Dr Ming Lei and Dr Elizabeth Cartwright of the Faculty of Medical and Human Sciences, Dr Xin Wang (Life Sciences), and in Chicago by Professor John Solaro and Dr Yunbo Ke, is published in the leading cardiovascular journal, *Circulation*. The work was funded in the UK by the British Heart Foundation and the Medical Research Council, and it is hoped it will advance current treatments for heart failure, which at present affects 750,000 people in the UK.

Scientists developing breast cancer treatment test

In what looks like an odd pairing, fruitflies have helped Manchester scientists develop a test for use with breast cancer patients.

Researchers have discovered a key breast cancer development molecule called Notch, which can be targeted by newly developed Notch inhibitor drugs. The gene that codes for Notch was first identified in fruitflies nearly a century ago, and turns out to control how cells interact with each other.

Dr Keith Brennan, of the Faculty of Life Sciences, will develop a way of detecting Notch in patients' tumours by measuring 'surrogate' molecules that indicate Notch's presence. To test whether these surrogate proteins are really useful in predicting patient progress, Dr Brennan will measure their levels in 450 breast tumours from people whose treatment resistance and long term survival are known.

Dr Lisa Wilde, Director of Research, Breast Cancer Campaign said, "Dr Brennan's innovative project will take the first vital steps in developing a test to predict which people are most likely to benefit from Notch inhibitor drug treatment. This could be used to identify which patients should be included in clinical trials to assess the drugs' effectiveness."

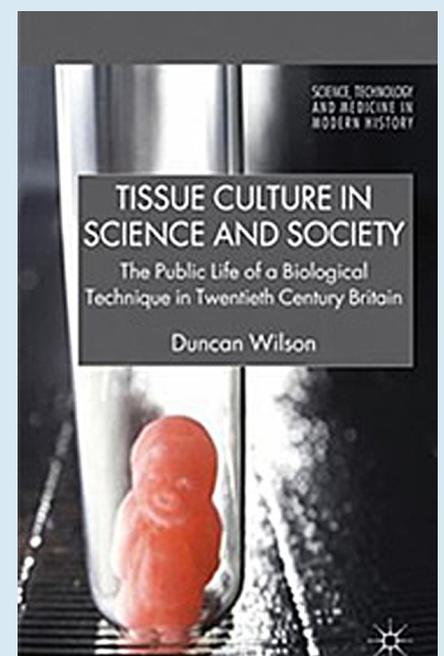
Could you love a chemical baby?

The scientific use of human tissue and cells has become controversial. To many people it typifies a longstanding divide between science and the public. Critics claim that scientists view tissue and cells as a scientific resource and have long worked in secret. They suggest that public resistance to such developments is caused because scientists ignore public demands for openness.

One technique that often features in such discussions is tissue culture, which involves the maintenance of human and animal material in laboratory conditions. Duncan Wilson's new book, *Tissue Culture in Science and Society* (Palgrave, 2011), sheds new light on the history of tissue culture. He shows that, from its first development in 1907, as well as being discussed at scientific meeting and in journals, it also appeared in films, newspaper reports and fictional stories.

The book challenges claims that popular attitudes to research on tissues are always negative, unchanged and opposed to science. It shows how popular attitudes have changed over time, in line with broader concerns: from interest in 'better breeding' during the 1920s, to the development of new therapies during the 1950s, and patient rights from the 1980s.

Dr Wilson demonstrates that there was two-way traffic between scientific and popular concerns. Far from operating against public attitudes, scientists who used tissue culture drew upon and influenced them. For example, in 1926 Thomas Strangeways drew on interest in 'better breeding' to claim that tissue culture legitimated 'the test tube baby'. This was widely reported by newspapers and informed novels like *Brave New World*; and these popular sources, in turn, influenced the ways that scientists presented and used tissue cultures.



Focus On... Our Sporting Achievements

Olympic Hopes for Faculty Student

Graeme Thomas a Biomedical Sciences student at Manchester has trials this month to join the Great Britain London 2012 Rowing Team.

Graeme is currently ranked 8th in Great Britain (GB) and with seven places available on the team for sculling is determined to break into the squad this spring after the GB final trials. After 2012, regardless of making the Olympic team he is aiming to be part of the new intake for the 2013-1016 Olympiad and train full time with the GB Rowing Team.

Graeme, who is in the final year of his degree, has combined his sport and his studies with the support of staff at the Faculty of Life Sciences and with help from the University of Manchester's Sports Scholarship Scheme which provides a range of support for students including funding free gym access and coaching.

Graeme says:

"Balancing sport and a degree is difficult especially, rowing as it is a particularly time consuming sport and there is little time for anything else but it's the choice I make and love doing it and I enjoy being busy and I do feel a sense of doing something unique and purposeful.

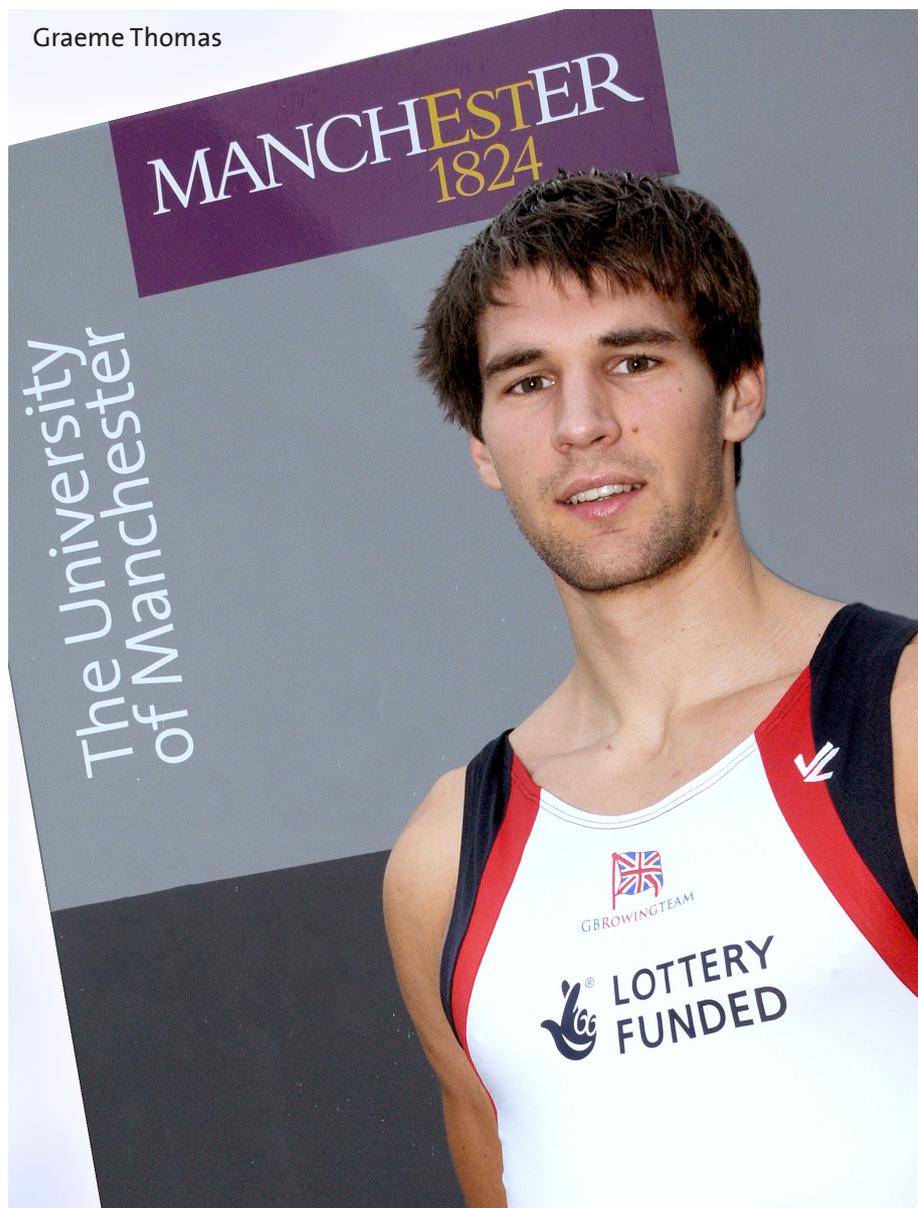
The network of support the Manchester Sports Scholarship opened up to me has been really beneficial. It's always great to be around people in the same boat and share tips and tricks, whether it be about diet, a quiet area of the university gym to get a session done or just to appreciate that we're all juggling a lot of work with a lot of training."

As well as Graeme the Faculty has nine other students who are competing successfully at sports at a regional or international level. Our sports stars include a rugby player for the Sale Sharks, an Ice Hockey player for the Manchester Phoenix and an England under 21 international badminton player.

We are proud of the sporting successes of our students and endeavor to support them in balancing a demanding training and competition schedule with the pressures of achieving a high quality degree.

In their profiles our students discuss the rewards of their sport as well as pressures of maintaining a sports career alongside their studies.

Graeme Thomas



NAME: MAX DRAKELEY

DEGREE: COGNITIVE NEUROSCIENCE AND PSYCHOLOGY

(WITH INDUSTRIAL/PROFESSIONAL EXPERIENCE)

SPORT: ICE HOCKEY

Proudest sporting achievement:

Winning the English Premier League with the Manchester Phoenix and being selected for the England U19s team and the University Great Britain squad.

Next big goal:

I hope to secure a placement in either America or Canada in my 3rd year and play at a high standard out there.

"It's very tough when training sessions either coincide with lectures during the day or are really late at night when I have early morning starts too.

My personal advisor and tutor are both aware of my sporting commitments and have gone out of their way to help me with my academic work numerous times including extending deadlines on essays and other tutorial work.

Ice Hockey is a very expensive sport to play so the financial aid I receive for equipment is very useful. They also provide me with a free gym membership, which is very useful for maintaining fitness off the ice. The Sports Scholarship team has also helped me improve my time management skills to handle the requirements for both academic and sporting success. "



NAME: CHARLIE AMESBURY
DEGREE: BIOLOGY
SPORT: RUGBY

Proudest sporting achievement:
My most proud achievement so far is representing my country (England) at the 7s format of the game.

Next big goal:
To become a regular in the Sale Sharks first XV, and win silverware with the club.

“Although I find it difficult to make all my university commitments, the response from the faculty members has been outstanding. The faculty have been sympathetic to my situation and treated me as an individual. Techniques such as podcasting make sure I realise the full benefit of lectures when I cannot make them, and allows me to commit fully to my sporting needs and catch up on work when it is convenient to me.

Being a student can be a costly occupation, marry this with aspiring to be the best at my sport can be quite a burden on the finances. To aspire to be the best, it is accepted that I use the elite training materials and equipment which can get expensive.

The Sports Scholarship has alleviated some of the financial burden, allowing me to have more freedom in the choices I make.”



NAME: JACK READING
DEGREE: OPTOMETRY
(UNDERGRADUATE MASTERS)
SPORT: CYCLING

Proudest sporting achievement:
The two at the top have got to be finishing 3rd at Crankworx in Whistler, Canada, then finishing 12th at the Val Di Sole world cup in qualifying.

Next big goal:
Having a successful first full world cup season and continuing to advance towards the top of the sport.

“You have to be completely focused on what you want to achieve from both areas in order to succeed.

The Faculty have been very understanding and supportive in helping me balance racing life with University. Specifically Dr Elizabeth Sheffield who heads student support has helped me get exam timetables adjusted so I can fit in trips abroad to important events and still attend all of my exams.

The components of the sport scholarship which I find most useful are the strength and conditioning sessions with Nick Jones along with the gym access, and then the financial support which helps with travel to races is also greatly appreciated. “



Jack Reading

NAME: MELISSA FINLAY
DEGREE: DEVELOPMENTAL BIOLOGY
SPORT: KARATE

Proudest sporting achievement:
In September I represented England in the World Shotokan Karate Championships in Chicago. As part of my three person team we won the Junior ladies team fighting event.

“The Faculty of Life Sciences has supported me in allowing me time off for international competitions and helping me choose the most appropriate project so I can balance my time effectively. “



Royal Society Summer Exhibition



The Royal Society Summer Exhibition in London July 2-8 2012. A team of eighteen scientists from the University of Manchester led by Phil Manning from SEAES but including FLS's own Bill Sellers, Mike Buckley and Matthew Cobb will be running an exhibit called "Palimpsests, Palaeontology and Particle Physics".

This exhibit will showcase the team's research at the Stanford Synchrotron looking at the chemical composition of fossils and what this can tell us about the animals and plants when they were alive. Learn about the pigment that once coloured prehistoric feathers and how fossils can help the rad-waste industry of the future!

See details of last year's event at:
<http://royalsociety.org/summer-science/2011/>



Presented by Ceri Harrop and Greg Counsell

Previous features include "Robomonkeys", "What makes us yawn" and "Why plants are so confused by our weather"...

New episode out every other Friday and available from the FLS website:
www.ls.manchester.ac.uk/podcast

If you have any interesting news or features from the field of Life Sciences you can contact us at: podcast@manchester.ac.uk

Zoology Student in Sloth Documentary



Becky Cliffe, a final year Zoology student has recently returned from her placement year at the Sloth Sanctuary of Costa Rica. This is a small, family run centre dedicated to the rescue, rehabilitation and release of the two species of sloth found in Costa Rica. Very little is known about sloths - even the most basic knowledge such as their natural diet is still largely a mystery - so the sanctuary has struggled with trying to conserve an animal despite knowing little about it.

Additionally, this lack of information about wild sloths means the sanctuary has been unable to successfully release any of their growing number of residents into the wild. The sanctuary invited Becky to come and do some research on sloth biology and behaviour, in the hope that this would be a first step towards being able to release some sloths back into the wild.

Becky features in a documentary, which premiered in the UK on Animal Planet and on the Discovery Channel.

UCISA Award for FLS's Stuart

Stuart Phillipson, Digital Media Projects Co-ordinator has been awarded 'highly commended' in the 2012 Universities and Colleges Information Systems Association (UCISA), Eduserv Awards for Excellence for leading 'The Podcasting Project' which enables academics to produce high quality video podcasts, without any prior training.

Well done Stuart!

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
Tel: 0161 275 5765
Email: natalie.liddle@manchester.ac.uk

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

With thanks to contributors: Charlotte Alcock, Natasha Bray, Sarah Fox, Liz Granger, Laura Ann Jones, Catherine Spanswick