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Calendar of Events

UCAS Interview Afternoons
Date: 3, 4, 11, 17, 18, 20 & 24 Feb
Time: 12pm - 4pm
Location: DS/008

Organic Symposium
Date: Wednesday 19 February
Time: 2pm
Location: A101
Speaker: Dr Stephen Thomas and Professor Luc Brunsveld

Opening of the York Atmospheric Chemistry Laboratories
Date: Monday 17 March
6pm: Public Lecture by Professor Ravishankara, Earth System Research Laboratory

Bruker Poster Competition
Date: Thursday 20 March
Time: All Day
Location: A101 / A102

Date of Next Issue: 22nd February 2014
York Chemists’ Significant Step Forward in Biofuels Quest

Chemists at the University of York have made a significant step in the search to develop effective second generation biofuels.

Researchers from the Department of Chemistry at York have discovered a family of enzymes that can degrade hard-to-digest biomass into its constituent sugars.

‘First generation’ biofuels have already made an impact in the search for renewable and secure energy sources particularly through the generation of bioethanol manufactured from easy-to-digest food sources such as corn starch.

But the resulting need for energy crops is using up valuable arable land threatening food price stability and limiting the amount of biofuel that can be made in this way.

The use of ‘difficult-to-digest’ sources, such as plant stems, wood chips, cardboard waste or insect / crustacean shells, offers a potential solution. Fuel made from these sources is known as ‘second generation’ biofuels. Finding a way of breaking down these sources into their constituent sugars to allow them to be fermented through to bioethanol is regarded as the ‘Holy Grail’ of biofuel research.

Reported today in Nature Chemical Biology, the new research was led by Professor Paul Walton and Professor Gideon Davies at York and also involved Professor Bernie Henrissat, of CNRS, Aix-Marseille Université, Marseille, France. It opens up major new possibilities in the production of bioethanol from sustainable sources.

By studying the biological origins and the detailed chemistry of the enzyme family, the researchers have shown that Nature has a wide range of methods of degrading biomass which humankind can now harness in its own endeavour to produce sustainable biofuels.

Professor Walton says: “There’s no doubt that this discovery will have an impact on not only those researchers around the globe working on how to solve the problems associated with second generation biofuel generation, but—more importantly—also on the producers of bioethanol who now have a further powerful tool to help them generate biofuel from sustainable sources such as waste plant matter.”

The research at York was funded by the Biotechnology and Biological Sciences Research Council (BBSRC).
Notes to editors:

- The paper ‘Discovery and characterization of a new family of lytic polysaccharide monooxygenases’ is published in Nature Chemical Biology http://dx.doi.org/10.1038/nchembio.1417

- BBSRC invests in world-class bioscience research and training on behalf of the UK public. Our aim is to further scientific knowledge, to promote economic growth, wealth and job creation and to improve quality of life in the UK and beyond. Funded by Government, and with an annual budget of around £467m (2012-2013), we support research and training in universities and strategically funded institutes. BBSRC research and the people we fund are helping society to meet major challenges, including food security, green energy and healthier, longer lives. Our investments underpin important UK economic sectors, such as farming, food, industrial biotechnology and pharmaceuticals. For more information about BBSRC, please visit www.bbsrc.ac.uk

Ryan Gorman Wins First Prize at Winter Process Chemistry Conference’s Poster Session

Ryan Gorman won First Prize (£100 in Amazon vouchers) in the poster session at the 'Winter Process Chemistry Conference' in Leeds in December 2013. The poster, shown in the photo, was entitled 'Copper-Catalysed Synthesis of Medicinally Interesting Heterocycles'.

Ryan is in the second year of his PhD with Richard Taylor, supported on an Innovative Medicines Initiative, Chem21 Studentship.
Researchers from the Department of Chemistry are part of a UK team which has made an important step towards new malaria treatments by identifying a way to stop malaria parasites from multiplying.

In a study published in Nature Chemistry, the research team shows that the activity of an enzyme called NMT is essential for the survival and viability of the most common malaria parasite. The team, which includes researchers from the York Structural Biology Laboratory in the Department of Chemistry at York, are working to design molecules that inhibit NMT’s function, and hope to start clinical trials of potential treatments within four years.

An estimated 1.2 million people died from malaria in 2010. Although a variety of antimalarial drugs are available, some strains of the parasite are resistant to treatment. These strains are becoming more common, with treatment failures reported across multiple frontline drugs. If acute illness is cured, the parasite can remain dormant in the blood and return to cause illness later.

Malaria vaccines have been researched intensively, but none have been introduced into clinical practice.

The new study shows that NMT is involved in a wide range of essential processes in the parasite cell, including the production of proteins that enable malaria to be transmitted between humans and mosquitoes, and proteins that enable malaria to cause long-term infection.

The researchers have tested a handful of molecules that block the activity of NMT in the parasite living inside human red blood cells, but further refinement will be needed before a treatment is ready to be tested in humans.

Professor Tony Wilkinson, of YSBL, said researchers at York carried out X-ray analysis of crystals of NMT to establish the mechanisms by which these molecules inhibit the action of the enzyme.

“The project has blended imaginative medicinal and analytical chemistry with protein crystallography and cell biology to define a new drug target in the fight against malaria, a major cause of human disease. While the research was targeted strategically towards drug discovery, it has given fundamental insights into how malaria parasites function,” he said.
Dr Ed Tate, from the Department of Chemistry at Imperial College London, who led the project, said: “Here, we’ve shown not only why NMT is essential for a wide range of important processes in the parasite, but also that we can design molecules that stop it from working during infection. It has so many functions that we think blocking it could be effective at preventing long-term disease and transmission, in addition to treating acute malaria. We expect it to work not just on Plasmodium falciparum, the most common malaria parasite, but the other species as well.

“We need to do some more work in the lab to find the best candidate molecule to take into clinical trials, but hopefully we’ll be ready to do that within a few years.”

The discovery is the culmination of a five-year project by a consortium of researchers from Imperial College London, the National Institute for Medical Research, the University of Nottingham, the University of York, and Pfizer, funded by the Medical Research Council, the Engineering and Physical Sciences Research Council, and the Biotechnology and Biological Sciences Research Council.

Notes to editors:
• M.H. Wright et al. ‘Validation of N-myristoyltransferase as an antimalarial drug target using an integrated chemical biology approach.’ Nature Chemistry, 2013.

• For more information about the York Structural Biology Laboratory, please visit http://www.york.ac.uk/chemistry/research/ysbl/

Recruitment of New Lecturer in Chemistry

Closing date 23 February 2014

The Department of Chemistry seeks applications for a Lectureship in Chemistry.

We welcome applications in any area of Chemistry but particularly those which enhance and extend existing departmental research strengths.

The successful applicant will possess excellent, independent, research skills and will be expected to contribute to teaching at both undergraduate and postgraduate levels.

Informal enquiries should be addressed to Professor Richard Taylor, email: chem-hod@york.ac.uk; Tel: +44 (0)1904 322500.

The vacancy is for a full time position and ideally the successful applicant will be in post by 1 October 2014.
The Biorenewables Development Centre (BDC), established through a collaboration between the Green Chemistry Centre of Excellence (GCCE) and the Centre for Novel Agricultural Products (CNAP) has secured further funding from the European Regional Development Fund (ERDF) to help eligible regional SMEs (small to medium-sized enterprises) buy equipment to innovate and expand into the biorenewables area.

Eligible SMEs looking to implement pilot-scale technologies in the biorenewables area can get 64% of the funding towards the purchase of capital equipment (up to £32,000 per SME), with the additional 36% to be matched by their private funding. “This is an amazing opportunity for regional SMEs to invest in greener technologies, for example by turning their bio-based wastes, such as wood or food wastes, into useful products”, says Dr Fabien Deswarte, Business Development Unit Manager at the BDC. “Our new Biorenewables Capital Grant Scheme will allow SMEs to purchase key pieces of equipment to test proof of concept, before committing to full scale industrial development”.

This scheme will add to the BDC’s offering for regional SMEs, and will help Yorkshire and Humber businesses develop new ways to convert plants, microbes and bio-based wastes into profitable green products.

The scheme will initially be rolled out over three competitive funding calls in 2014, with the first deadline for expressions of interest set for 3 March 2014. The scheme is expected to fund around 26 projects; further information on how to apply will be available from February. Please contact Vicky Wren, ERDF Project Manager at the BDC (Vicky.wren@york.ac.uk, 01904 567825) if you think that any of your industrial contacts might benefit from this scheme and keep an eye out on our digital channels for further details.
York Chemists Investigate the Fibre of Our Being

We are all aware of the health benefits of "dietary fibre". But what is dietary fibre and how do we metabolise it?

Research at the University of York's Structural Biology Laboratory, in collaboration with groups in Canada, the USA and Sweden, has begun to uncover how our gut bacteria metabolise the complex dietary carbohydrates found in fruits and vegetables.

Trillions of bacteria live in human intestines - there are about ten times more bacterial cells in the average person's body than human ones. Known as “microbiota”, these bacteria have a vital role to play in human health: they are central to our metabolism and well-being.

The research team has uncovered how one group of gut bacteria, known as Bacteroidetes, digest complex sugars known as xyloglucans. These make up to 25 per cent of the dry weight of dietary fruit and vegetables including lettuce, onion, aubergine and tomatoes.

Understanding how these bacteria digest complex carbohydrates informs studies on a wide range of nutritional issues. These include prebiotics (the consumption of 'beneficial' micro-organisms as a food supplement) and probiotics (the consumption of foods or supplements intended to stimulate the production of healthy bacteria in the gut).

Researchers from the York Structural Biology Laboratory in the University's Department of Chemistry, and international collaborators have carried out detailed structural and mechanistic studies into the precise functioning of specific enzymes. This work has shed further light on which organisms can and cannot digest certain fruits and vegetables, and how and why the "good bacteria" do what they do.

Professor Gideon Davies, who led the research at York, said: “Despite our omnivorous diet, humans aren't well equipped to eat complex plant matter; for this we rely on our gut bacteria. This work is helping us to understand the science of that process.

The research at York was funded by the Biotechnology and Biological Sciences Research Council (BBSRC).

“The possible implications for commerce and industry extend beyond the realm of human nutrition, however. The study of how enzymes break down plant matter is also of direct relevance to the development of processes for environmentally-friendly energy solutions such as biofuels.” - Professor Gideon Davies, YSBL.
The Department of Chemistry has been described as a ‘safe and supportive’ place for LGBT students in a survey conducted by Dave Smith.

The small-scale survey was organised with the help of some of the ‘out’ LGBT students in the department and asked four questions, including whether it was important to have ‘out’ members of staff in the department and what more the Chemistry department can do to help LGBT students. The results were overwhelmingly positive, with students stating that overall, the department was supporting LGBT students.

In particular, the students noted that the atmosphere in the department was hugely positive with other students being very accepting and staff being non-judgmental. Many commented that having ‘out’ students and members of staff in the department was hugely beneficial. Indeed, several students noted that having departmental LGBT role models in the department, and an accepting environment, significantly helped their own coming out processes.

Although students felt well supported by the department, most felt that they would probably prefer to not discuss LGBT specific issues with their supervisors, although they added that many students, not only LGBT, found talking about personal issues difficult. Several noted that they would, however, broach the subject if it was affecting their work, while others suggested that there were other members of staff they would happily talk to. Many students commented on how happy they have been in the department, and several of them found the atmosphere here particularly refreshing in contrast to their schools, where LGBT issues were not discussed.

Carrying out a survey of this type is quite unusual – LGBT is largely a hidden diversity issue, unlike women in science or the representation of ethnic minorities. As such, very little is known about the experience of LGBT students in a chemistry department. Many scientists may argue that sexual orientation is irrelevant to science, and as such, there is no need for it to be an ‘issue’. However, the responses of the survey about the value of role models made it strikingly clear that students hugely value an environment in which they can openly see that people ‘like them’ are accepted and successful. They also feel it helps dispel stereotypical views which others may hold, and allows them to feel much happier and more comfortable.

A brief, and very positive, report of this survey appeared in ‘York Vision’ and in this, Dave Smith noted, “As a gay academic myself, I was really pleased to see that our students considered the
department to be a welcoming place for students, irrespective of sexual orientation or identity. They all felt well supported, and experienced effectively no homo/transphobia from other students. It has not always been like this in UK chemistry departments – nor is it still in some. It was also particularly interesting to see the impact which students feel that our ‘out’ role models have had in the department – I had hoped it might have some impact, but was amazed to see how positive the student’s responses were.”

The full results of this survey are now going to be considered by the Departmental Diversity Committee – if you would like any further information on the results of the survey, or if you identify as LGBT and would like to feed in your own opinions (either in person or anonymously), please contact Dave Smith.

‘A Bad Day in the Lab’ by Emma Dux

A bad day in the lab...

I’m sure there was a lab here when I first started this reaction

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Interview with Liza Binnington

Undergraduate Teaching Laboratories Assistant

Well, where to begin….. I usually shy away from the limelight and would never deliberately draw attention to myself, so when asked if I would contribute to Chemistry Update, I had mixed feelings. However, as I always enjoy reading about other people and the path they have taken to get to their current role, I thought I should reciprocate.

I was born in the “exotic” seaside resort of Cleethorpes and grew up in Grimsby. I then went to Bradford University and obtained a degree in pharmacy. I also met my husband, optometrist Jonathan Binnington. On graduating we moved to Darlington where I worked as a hospital pharmacist. Two years later we relocated to York so that Jonathan could join the family practice Binnington and Thurling Opticians on Micklegate; I became a locum community pharmacist. Initially I worked for FW Wood and Son (a local independent group) and finally for Boots the Chemists. During that time pharmacy changed a great deal- minimal compounding of products in-house, more previously prescription only medicines becoming available over the counter and greater use of clinical skills in patient medication reviews, supervised methadone consumption and supply of emergency hormonal contraception. In 2007 I left the profession since I was no longer enjoying the job and wanted to spend more time with my family.

I have two children: Thomas who is studying aeronautical engineering at Bath University and James who is in the sixth form at Fulford School. Now they are older, aside from chauffeuring them around, I run after our cocker spaniel Meg instead. Saturday and Sunday mornings are now shared with a really fun welsh cob called Rosie and not spent on the side-lines of a football pitch!

My next job was six months of “arduous” chocolate tasting at Nestle. I had to spend two hours every Monday and Tuesday scoring chocolate on a scale of 1-10 on its sweetness, hardness etc. or counting and sizing bubbles in aerated chocolate. Unfortunately for my waistline I still have an insatiable craving for the creamy, cocoa-containing foodstuff!

In 2008 I became a part-time science technician at Manor School. This basically involved preparing the chemistry, physics and biology practicals for 11 to 16 year olds. The senior technician tutored me on new or forgotten skills and encouraged me to go on courses at the National Science Learning Centre. It was there I attended a speech with some chemistry demonstrations by Professor Sir John Holman. I absolutely loved the role, especially (sadly some might think) making up solutions.

When I saw the job for a laboratory assistant in the teaching labs at the University advertised I thought it would be a great career move and progression. After an informal visit to the department I applied for the position and was fortunate enough to be offered the post. I started in October (along with the students) and as all the staff have been friendly and supportive I am settling in and thoroughly enjoying my work.
I started my current role as Technical Liaison Officer for the Industrial Engagement Facility which is due to become fully operational in Green Chemistry in the soon to be completed F-Block. Born in Birmingham and raised in Stoke, I first came to York in 2002 to study for my MChem on the Chemistry, Resources and the Environment course, throughout which I frequently did pub and restaurant work in the holidays to top up my coffers. One of my most memorable summers was spent working for a chain restaurant that was out-performing all the other outlets so well that we had all the executives and chefs from across the country meeting there to discuss everything from the new menu launches to the upcoming Christmas specials. Having all the free time over the summer, I was more than happy to get extra hours by going in out of hours to assist these meetings, mainly by helping our extremely talented head chef go to town in creating various dishes to recommend to the people at head office. Whilst I didn’t become Masterchef by any stretch of the imagination, I certainly learnt a fair amount watching him in action, as well as picking up an interest in cooking and food.

After graduating, I ended up back there, initially planning to work there for summer and Christmas before flying out to Japan to teach English for a year; a plan that was unfortunately thwarted by contracting Appendicitis and being barred from flying for 3 months. Instead, I applied for the vacant Assistant Managers position and got it, before getting accepted onto my PhD back in York and Green Chemistry with Moray Stark, studying the effects of biodiesel on engine lubricants during usage. Whilst writing up my thesis I moved to Nottingham where I worked for a year and a half at Castle Environmental chemical waste treatment plant. Whilst it was very valuable industrial experience and taught me a lot about environmental and waste legislation, it was also very mucky and so after graduating I was therefore more than happy to return to Green Chemistry and York once more to take up my new position as part of the WasteValor project. The project involves deriving value from food waste as opposed to sending it to landfill to rot and specifically, as part of the IEF, to boost the local economy in this field by providing assistance to local businesses from food waste producers (from dairies to coffee shops) to food waste users (e.g. biodiesel, cosmetics producers) and all companies in between and therefore continuing my trend of always working somewhere with either a lab or a kitchen, and now both! So far my work has taken me to Betty’s and Taylors’ main bakery, Wensleydale Cheese manufacturers and the York Food & Drink Festival amongst others. I’m loving my work so far and feel very fortunate that this position enables me to combine 3 of my main interests in sustainability, chemistry and food. As a result, I suppose I also find it fortunate that my wage also adequately covers my gym membership…
Just before Christmas, Professor John Goodby, pictured below with President Lesley Yellowless, was awarded the Derek Birchall Medal of the Royal Society of Chemistry at the Society's Annual General Meeting. The Derek Birchall Award rewards an individual for creativity and excellence in the application of materials chemistry in industry. A few days later, as Chair of the Royal Society's Young People's Book Prize for 2013, John was with Sir Paul Nurse to present the awards to the short-listed authors. This year's winner was Rob Lloyd Jones for his book entitled "Look Inside Space". A shortlisting panel, Chaired by John, read all the entries (~50) submitted (~50) and picked their six favourite books. The task of selecting a winner was handed over to the people who should know best – young people aged up to 14 in judging panels in schools, libraries, science centres and youth groups across the UK.
O’Brien Group News

Professor Peter O’Brien, together with PhD students Giacomo Gelardi and James Firth, attended the 10th International Symposium on Carbanion Chemistry in Kyoto. Peter gave a plenary lecture, dedicated to the memory of Bob Gawley. There was some time for a bit of site-seeing – below is a picture of Giacomo and James in front of a temple in Nara – the largest wooden building in the world!

In addition, Peter has recently given research talks at St Andrews and Keele.

SCI Careers Event Wednesday 5th March

The Society of Chemical Industry will be running a careers event on Wednesday afternoon on 5 March.

There will be three speakers from industry and one from academia talking about their careers.

All students and staff are invited.
Professor Sir John Holman in Science Council Top 100 List

Professor Sir John Holman has been named in a list of 100 practising scientists in a poll conducted by the Science Council. Challenging the UK's narrow and old-fashioned view, the Science Council's list is being used to highlight a collective blind spot in the approach of government, media and the public to science - which either tends to refer to dead scientists or to regard only academics and researchers as scientists.

Chief executive of the Science Council, Diana Gamham, said: "It is vital that this narrow vision is challenged urgently because it is inhibiting education policy, the career ambitions of young people and investment in developing the skills we need to deliver a world class economy."

The Royal Society of Chemistry's chief executive, Dr Robert Parker, said: "This list does a fantastic job of showing that not all chemists wear white coats and that a career in chemistry doesn't mean you have to work in the laboratory.

To identify its list, the Science Council organised a competition to identify leading individuals in different categories of ‘10 types of scientist.’ Each type draws on a different mix of skills, knowledge and expertise. Amongst the categories are Explorer, Investigator, Entrepreneur and Communicator. Professor Holman is one of two chemist's named in the Teacher category.

In other news, Sir John Holman has been elected a Member of Council and Trustee of the Royal Society of Chemistry, joining Duncan Bruce who is already on Council.

Organic / Organometallic Chemistry News

On the road – in January 2014, Professor Ian Fairlamb visited several Universities and a Company to discuss future collaborations. The first visit was to the University of Bath, to discuss mechanistic aspects of palladium nitrite chemistry with Professor Paul Raithby. Following on from a paper published in Chemical Science in 2012, plans are in place to look at higher oxidation state palladium species containing nitrite anions, particularly using Synchrotron radiation (namely Diamond).

Finally, Ian has been awarded Synchrotron Beamline time through the Catalysis Hub, which will take place in early March at the Diamond Synchrotron.

The second visit was to CatSci (SME company) based in Cardiff. CatSci specialise in the rational
other challenging understanding, development, optimisation and scale-up of catalysed reactions and processes. Their interests align with the mechanistic work going on in York on transition metal-catalysed processes. We are looking to strengthen interactions with CatSci over the coming years. The visit was supported by the EPSRC Industrial Engagement Award. With his collaborator Dr Natalie Fey (University of Bristol), Jason Lynam also visited CatSci in January using EPSRC Industrial Engagement funding.

The third visit was to see Professors Adam Lee and Karen Wilson to discuss future Synchrotron beamtime applications, relating to palladium nanoparticle catalysis. Ian was also able to see the new laboratories at the Bioenergy Institute (Aston University), which are outstanding.

The last visit was to see Professor Roy Johnston at the University of Birmingham to continue collaborative work on the degradation of Pd$_2$(dba)$_3$, specifically theoretical work on the characterisation of Pd$_n$ clusters ($n = 3$-$8$) containing dibenzylidene acetone (dba).

**Atmospheric Chemists in Guam**

Several members of the Atmospheric Chemistry group are in Guam this month, collecting data for the Coordinated Airborne Study in the Tropics (CAST). CAST is an atmospheric measurement campaign with coordinated flights from the FAAM BAe-146, NSF/NCAR HIAPER and the NASA Global Hawk. The main focus of CAST is to study the chemical and physical properties of the tropical tropopause layer (TTL) and to understand their impacts in controlling the composition of the UTLS (upper troposphere lower stratosphere). The research will be delivered in partnership with NASA through collaboration with the NASA Earth Venture ATTREX1 (Airborne Tropical Tropopause Experiment) mission deploying the NASA Global Hawk unmanned aerial vehicle (UAV).

Follow their progress at

https://www.facebook.com/coordinatedstudytropicsGuam

and

https://twitter.com/CAST_Guam
Graduation

Congratulations to all our Chemistry students who graduated on 25 January 2014. The Saturday morning ceremony was followed by a drinks reception in the department where staff and students shared a celebratory drink with graduates and their families. The rain even held off to ensure everyone had dry gowns for some photographs! Many thanks to everyone who attended, and many congratulation to the following students:

**PhD in Chemistry**
- Molly Crisp
- Will Edwards
- James McKenzie
- Gareth Moody
- Peter Rayner
- Thomas Williams
- Christopher Windle
- Xiao Wu

**In absentia**
- Navpreet Sethi and Neungrutai Saesaengseerung

**MSc by Research – in absentia**
- Will Manning

**BSc Chemistry**
- Anthony Starling
- James Gutteridge

**MChem Chemistry**
- Steven Spall

**MSc Green Chemistry and Sustainable Industrial Technology**
- Fergal Byrne
- Adonis Kriticos
- Tianzong Li
- Sarah Makin
- Shouxi Meng
- Edward Monteith
- Konstantina Sotiriou
- Benjamin Tumilty
- Tong Wu
- Jiahan Yin
- Qing Zhang
- Shengjie Zhao
- Zhao Zhao

**In absentia**
- Christopher Forde
- James Reilly
- Siying Tang
- Keisuke Tomono
- Yiliguma
Funding Boost for Biological Chemistry Research

New funding is allowing chemists at the University of York to further develop software underpinning research in the pharmaceutical industry and academic laboratories worldwide.

Dr Kevin Cowtan, of the University’s Structural Biology Laboratory, has been awarded a £470,000 five-year research fellowship from the industrial income of Collaborative Computational Project Number 4 in Protein Crystallography (CCP4), a project hosted by the Science & Technology Facilities Council (STFC).

CCP4 is a long-running project developing software used to determine the three-dimensional structures of biomolecules (proteins and nucleic acids) by macromolecular X-ray crystallography (MX). Crystallography is a technique which can provide the most detailed structural information about a molecule. Dr Cowtan also heads the York element of a successful consortium bid to the Biotechnology and Biological Sciences Research Council (BBSRC) for continued funding of CCP4.

Structures derived through MX make a key contribution to scientists’ understanding of how proteins work, which provides the basis for applications in the pharmaceutical and biotechnology industries.

Dr Cowtan said: “MX is an important tool in drug development, enabling the detailed design of drugs tailored to alter the action of biomolecules by blocking or promoting the chemical processes which the target molecule performs. X-ray structure determination requires intensive computational analysis, and the CCP4 software enables the biotech companies undertaking drug development to determine structures of protein-ligand complexes more effectively.”

The CCP4 team includes researchers from York, Newcastle, Kent, Leeds, Oxford and Cambridge, as well as the core group based at the STFC laboratory at Harwell. The software package, which was developed by a team including Dr Cowtan, is licensed nationally and internationally to industrial users in the pharmaceutical and biotechnology sectors.
Thank you to everyone who contributed to the Jovember and Movember campaign: https://mydonate.bt.com/teams/chemjomo

We raised a total of £3,005 (£3,702.50 including Gift Aid) with £334 raised at the candy and cake sale at the end of the month (thank you to ChemSoc and Katrina for organising this; another £167 was raised for The Philippines Typhoon appeal).

The website is still open for donations so if anyone would still like to contribute then any donations will be gratefully received!

Special thanks to those of you who cycled for miles (some of you in the cold, others in pink wigs), gave up one of the C’s (cake, chocolate, caffeine, crisps, carbohydrates) or alcohol, grew hair (facial or leg), or ran a long way (£10K and marathons). Hopefully you all relaxed and enjoyed yourselves in December.

Jo had surgery on 21 January and is now recovering at home, she too would like to thank those of you who took part in and/or and contributed to the fundraising.

Helen
F-Block Walkthrough

Here are some photographs of the new Chemistry F-Block taken on 9 January 2014.
By Clare Warren, CIEC Advisory Teacher in Hertfordshire

Twenty six Year 6 pupils from St Mary’s RC Primary School, Royston, walked to their local Johnson Matthey Royston site the end of 2013. This was Johnson Matthey’s first visit as part of the CIEC’s Children Challenging Industry (CCI) programme. They were there to find out about catalysts, building upon the science curriculum work they had been doing with me in school.

The tour started at a Technology Centre where wash coats for the catalysts are developed and tested.

This was followed by a demonstration of soot filtration to see how a catalyst removes soot from exhaust fumes.

They also saw catalysts being tested in cars on a rolling. The children enjoyed getting close to a Ferrari which was in the car testing area.
Children were in awe at the robots applying wash coats to the substrates and the massive ovens where substrate is baked.

The site visit reinforced the science lessons I had delivered in school, thanks to the training that Johnson Matthey personnel had received from CIEC prior to planning the visit. The children could see that the science they were doing is exactly the same as some of the processes they saw at Johnson Matthey.

In school they had followed a recipe to make soap; some children had more success than others! They also developed their own recipe to make bubble mix which they tested for durability and bubble size. This linked to scientists developing and following recipes to make wash coats. They devised their own test for viscosity and were able to relate this to the viscosity of the wash coats when they visited the site.

They learned to follow a series of processes to purify rock salt which is used to grit roads and turn it into salt they could put on their chips! The results of their purification processes were tested by scientists at Johnson Matthey and all the groups managed to produce salt which was more than 95% pure.

Deb McGarrity, Royston Site and Community Coordinator commented, "The difficulties of attracting young people into careers in science have been well documented in recent years. From this perspective, I think it is important that schools in our area understand what Johnson Matthey actually does, and how exciting and varied a career in science can be".

Robert Dunbar, Head teacher at St Mary's was most appreciative of Johnson Matthey support. "It has always been part of my philosophy that children should see science and ICT applied in the workplace."

Year 6 pupils commented enthusiastically:
"I think it is good for young people to learn about industry and to know what is coming in the future."
"Catalytic converters, Ferraris, quick robots, washcoat machines, use of different materials and all the brilliant technology were really cool".
Bike Doctor

Get your bike serviced by the Bike Doctor once a month! Avoid all the hassle of doing it yourself...... Routine maintenance checks free of charge, a special discount on major work.

There are also discounted cycle equipment for sale and also a sale of recycled bikes!

http://www.york.ac.uk/admin/estates/transport/cycling/recycled-bikes/index.html

Nearest Chemistry Cycle Storage

This by B block car park outside workshops, there is also more storage next to the WACL building. For other cycle storage areas on campus, see:

https://maps.google.com/maps/ms?
msid=212811965571150596714.0004d3797b546f4f09752&msa=0&ll=53.947044,-1.055331&spn=0.014523,0.027595

Cycletowork Extra

http://www.york.ac.uk/admin/hr/resources/forms/rewards_extra/cycletoworkextra_faqs.pdf

You are able to make big savings on the cost of new bikes and related safety and security equipment under a Government initiative (Green Transport Plan) aimed at getting more people to travel to work on their bikes. The University of York has linked with a partner company, 'Cyclescheme', who provide cycle purchase vouchers that are accepted by a wide range of bike retailers. The University offers a scheme, Cycletowork Extra, whereby you can order a Cyclescheme voucher to purchase a bike and additional safety equipment, worth up to £1,000 in total, through a salary exchange agreement with the University over a 12 month period.

Your nearest cycle storage locations can be found here:

http://www.york.ac.uk/admin/estates/transport/cycling/storage/index.html,
Discounted Bus Tickets

Staff and students can both benefit from discounted bus tickets. For more information, please see:

- [http://www.york.ac.uk/admin/estates/transport/public_transport/bus/staff.html](http://www.york.ac.uk/admin/estates/transport/public_transport/bus/staff.html) for staff, and:
- [http://www.york.ac.uk/admin/estates/transport/public_transport/bus/student.html](http://www.york.ac.uk/admin/estates/transport/public_transport/bus/student.html) for students.

Car Sharing - Why?

There are numerous benefits to car sharing for journeys in general and in particular to the University:

- Save money (typically around £1000 per year!) by sharing your travel costs
- Find a space with ease...priority parking is available in designated car share spaces (currently at Vanbrugh College)
- Congestion and pollution levels in and around York are reduced
- Meet new people
- Save wear and tear on your car as you only use it half the time
- Sit back, relax, and let your 'chauffeur' take the wheel and bring you to campus. Return the favour the following day!
- Cheaper University of York car parking permit

For more information please see [http://www.carshareyork.com](http://www.carshareyork.com)

City Car Club

Why take on the hassles of owning a vehicle and all the costs that come with it, when you can join City Car Club and have access to the car that’s based at the University of York as well as almost 600 other cars spread over York, Manchester, Leeds and 11 other UK Cities.

Vehicles are available 24 hours a day, 365 days a year and can be booked by the hour, day or week – however long you need it for, from only £5 per hour plus mileage.

As well as the vehicle we have on campus, there are almost 20 vehicles spread all over the city so you’re never far from a City Car when you need one!

Special Offer for University of York Staff and Students! For more details see below:

-[http://www.york.ac.uk/admin/estates/transport/carclub/index.html](http://www.york.ac.uk/admin/estates/transport/carclub/index.html)
Scanning a Photograph using a YPP Printer

As well as straight copying, it is possible to scan a photograph on a YPP device and have the electronic version emailed to your Googlemail box. Any of the YPP scanning devices will scan any photograph irrespective of whether the original photo is black and white or colour. There are instructions on how to get the best possible quality on the Chemistry Department website at:

http://www.york.ac.uk/chemistry/internal/staffinfo/workchem/computers/copyphoto/

Using the scanning technique, Tim Elsworth has prepared a special From the Archive with some photographs from the Chemistry archive.

From the Archive

The first photo shows the Meissner Effect which is shown by all superconducting materials. A magnet can be seen levitating above a disc of superconducting material which has been cooled to the boiling point of liquid nitrogen. The superconducting material was made in the department in an undergraduate research project and the effect was demonstrated on Departmental open days, a video camera being used to display the effect on a TV screen.
The second photo (below left) shows a demonstration of colourful lasers. I have no information on this image, maybe someone in the department can supply the missing detail.

Sophie Lane Receives Cantor Book Prize

Sophie Lane, a third year Undergraduate Student, receives her Cantor Book prize certificate from Richard Taylor. The Cantor Book Prize is awarded to the most deserving first year student (Sophie won the prize in 2012 but the certificate has only recently been sent through to the Department).
York Chemists Appear on BBC Radio 4

Just before Christmas, Kirsty High & Kirsty Penkman were interviewed by Inside Science on BBC Radio 4 about their analytical work at the archaeological site of Star Carr: (14½ minutes in on http://www.bbc.co.uk/programmes/b03ls15v - for those of you with more time on their hands you can also listen to a podcast which goes into a bit more detail on http://planetearth.nerc.ac.uk/multimedia/story.aspx?id=1526). A range of artefacts from Star Carr are on display at the Yorkshire Museum until May 2014.

Star Carr (near Scarborough) is an archaeological site of international renown due to the spectacular organic artefacts first uncovered in the late 1940s. The site dates to just after the end of the last Ice Age, and the wealth of the bone and wood archaeology (including antler head-dresses) is unparalleled in Europe.

However, recent fieldwork has revealed that the organic remains which made the site so famous, despite having survived for ~ 11,000 years, have become seriously degraded since the initial excavations 60 years ago. All the bone and antler recently found in the wet deposits are severely deteriorated: pieces of antler were completely flattened and had the consistency of leather; one of the only two pieces of bone found was completely demineralised (nicknamed ‘jelly-bones’); wood showed serious deterioration, with decay of the cellulose, leaving only a lignin-rich skeleton.

Why this was happening to the organic artefacts, and the rates of decay (and therefore the rapidity of the potential loss of the archaeology), were an unknown. Through a NERC CASE studentship in conjunction with York Archaeological Trust, Kirsty High has been studying the mechanisms and rates of degradation in wood and bone using a range of analytical techniques. These include pyrolysis - gas chromatography and infrared spectroscopy for investigating chemical changes to wooden artefacts, and amino acid racemisation analysis and powder XRD to determine changes to the bone structure. These are supplemented by techniques such as TEM, SEM and mass loss analysis. The evidence built up so far has provided critical data on the stability of archaeological material; relevant not only to this unique site, but others across Europe. This study will help mitigate against future losses of heritage of international importance.

Left: Star Carr ‘jelly-bone’, which has been demineralised in situ, making it flexible. Compare this to the stunning antler headdresses recovered in the 1940s (right).