



# Chemistry Admissions

February 2018 NEWSLETTER

## York Chemistry 2nd in Guardian League Table

Chemistry at York moved to 2nd place in *The Guardian University League Table 2018*.

*The Guardian* scored departments for satisfaction with teaching, the course and feedback, student-to-staff ratio, spend per student, average entry tariff, value added and career prospects after six months of leaving the course.

Out of 53 chemistry departments, York was ranked in an outstanding 2nd place, up two places from last year. York gained high scores across all areas with an overall score of 96.6% and 87.1% for feedback satisfaction; the highest of all of departments.

This completed a successful hat-trick of **top 4 places** for Chemistry at York in the **3 major University League Tables**, retaining our 4th position in both the *2018 University League Table* published by *The Times* and the *2018 Complete University Guide* (since the publishing of league tables in *The Complete University Guide*, York Chemistry **has never left the top 10**).

With the recent re-accreditation of all our undergraduate programmes by the Royal Society of Chemistry and the introduction of two new pathways in the next academic year, the Department is well placed to build on this success, and aims to continue improving both research and teaching in the coming year.



## Outstanding 2017 NSS Results

**With an overall student satisfaction rating of 95% and outstanding other results in the National Student Survey, York has confirmed its reputation as one of the very best places to study chemistry in the UK.**

Amongst its research-intensive Russell Group competitor departments, York Chemistry achieved **first place in a remarkable 7 of the 9 sections** of the survey – leading the way in Teaching on my Course (94%), Learning Opportunities (91%), Assessment and Feedback (80%), Academic Support (89%), Organisation and Management (91%), Learning Resources (96%) and Learning Community (89%).

Alongside previously recognised areas of teaching excellence, the Department was particularly delighted to come first in the Russell Group in the new NSS categories of Learning Opportunities and Learning Community. We believe these

reflect how we challenge our students to demonstrate and apply their knowledge of chemistry in a wide range of different ways and the way in which we enable student learning as part of a supportive community, with a **strong emphasis on small group tutorial teaching and teamwork**.

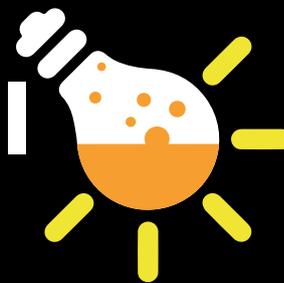


Head of Department, **Professor Duncan Bruce** said: *These very pleasing NSS results reflect the strength of Departmental teaching across the board and the unique York atmosphere in which our academic staff work hard to encourage all students to achieve their true potential.*

## Leading national education conference held in the Department of Chemistry

The Variety in Chemistry Education and Physics Higher Education Conference (ViCEPHEC) is the leading national conference for chemistry and physics education at tertiary level in the UK. This year the conference was held at York between 23 and 25 August. Delegates ranged from academic staff at universities to schoolteachers, outreach officers, laboratory specialists, technicians, students, industrialists and publishers. The event, attended by over 175 delegates, provided opportunities to share best practice within the disciplines of chemistry and physics by discussing cutting edge educational research and practice. **Professor John Holman** gave a thought-provoking plenary lecture in which he explored the transition made by students (and himself) between school and university chemistry education.





# Chemical Innovation



## Landmark free online course, eeDc, demystifies everyday organic chemistry

Exploring Everyday Chemistry (eeDc), a pioneer University of York MOOC (massive open online course), delivered by the FutureLearn platform, attracted learners from over 100 countries.

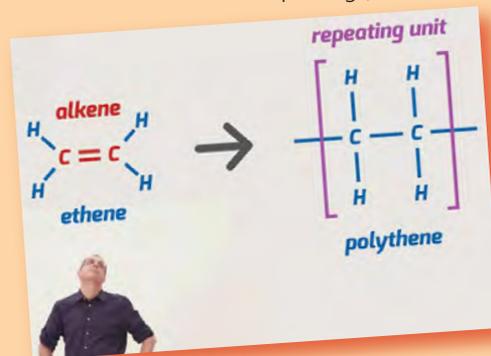


More than 9000 learners from well over 100 countries signed up for a first ever University of York MOOC, called *Exploring Everyday Chemistry*. The courses ran in January and July, and comprised four weeks of learning with 85 individual learning steps, including more than 30 videos and screencasts. It highlighted a range of **chemistry-based topics relating to our everyday lives** – from perfumes to antibiotics, brewing and sport, with an emphasis on the important role of organic chemistry. Aspects of recent research from the Department of Chemistry were included, together with examples of our undergraduate teaching materials.

Activities included experimenting 'in the kitchen' with hands-on projects ranging from extracting a plant fragrance, to testing the activity of spices against microbes – learners could share their results using tools such as Padlet and twitter (@eedcAndy, #FLchemistry). The course was designed to be of particular use to sixth-formers interested in developing independent learning skills to help the transition to university – marketing of the course to over 100 schools and colleges was supported by the University's Widening Participation team with a range of publicity created for feeder schools and colleges. Indeed, this admissions season, a number of our UCAS applicants have mentioned MOOCs, including *Exploring Everyday Chemistry*, in their personal statements.

Learner feedback was extremely positive (see left-hand column for examples), including on the choice of topics, the presentation style and learning resources.

The course development was led by **Professor Andy Parsons**, assisted by undergraduate chemistry students starting with **Katie Martinelli** and **James Titterton** who helped develop the project and facilitate the first running, then **Caitlin Evans**, **Craig Hardy** and **Josie Rogers** for the second running, including compiling some weekly videos (the course has attracted over 5000 postings).



Following the success of the first run, a slightly revised version of the course will start on **2 July 2018** (to register your interest: <https://www.york.ac.uk/study/moocs/>).

For details of the course content you might like to see our promotional video: <https://www.youtube.com/watch?v=ZDSJ8yrPEk4>

*This MOOC was one of the best I've followed so far. It helped me to refresh so much of the chemistry I learnt during my apprenticeship as a chemical laboratory assistant years ago. My daughters, who are still at primary school enjoyed the kitchen experiments a lot. Thank you very much for this excellent course.*

*"Wow, this week has been so interesting and a real challenge! I am so fascinated by all of the new things I have learned"*



*"thank you so much for running this excellent course"*

*"very challenging, very fun and interesting"*

*"Really interesting first week; differs completely from the specification for an A level student. Excited to start next weeks course"*

*The practicals were fun and the course was really interesting and insightful. Thank you York for this MOOC and I look forward to applying to your university next year.*

*"an excellent way to enthuse people to continue their study of chemistry by showing its practical application"*



*"This was a week of much learning, thanks to such good and documented articles and videos, many thanks to the entire team that made an excellent job possible"*

*"I will certainly look at sports people more closely in future!"*

**Ian Barr**, from the Centre for Lifelong Learning, who is coordinating MOOC activity at the University of York, wrote:

*Feedback from FutureLearn has been highly complimentary – the course has been deemed to be 'excellent' following Quality Assurance, and the trailer created to promote the course has been used as an exemplar by FutureLearn when meeting potential new European partners in how to create engaging content. It's been a genuine pleasure to work with Andy and the team and share in their enthusiasm for both chemistry and delivering a first-class learner experience.*



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### Sun, sea and electrochemistry

York researchers have found a new way of safely **trapping the greenhouse gas, carbon dioxide**, as a solid mineral, dawsonite. The process, developed by Professor Michael North and Dr Alison Parkin, uses scrap metal, seawater and electricity from solar panels, and is highly scalable. Some 850 million tonnes of carbon dioxide per year could be captured using nothing more than the dream summer holiday combination of sun and sea, along with some scrap metal and electricity.

### 3D structure of enzyme opens path to new drug design in brain disease

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Researchers at York and Simon Fraser University, Canada, have revealed the 3D structure of an enzyme that could provide a crucial step forward in **treating neurodegenerative diseases**. Previous work from these research teams investigated a class of diseases called tauopathies, which occur when tau proteins spontaneously group together in the brain. It is often associated with Alzheimer's and other neurodegenerative diseases. Research has shown that the tau protein can be modified by a sugar, natural to the body, called O-GlcNAc. This sugar can stabilise the protein to block it from clumping together and may thereby prevent disease. The human enzyme O-GlcNAc-hydrolase, however, is responsible for the removal of this crucial sugar from the protein, making it a prime target in preventing the progression of tau-related dementias. In order to understand how this clumping of tau could be prevented or reduced by increasing O-GlcNAc, scientists at York investigated the structure of the human enzyme to reveal how it is organised to function in this way.

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### Molecules in the body more visible in new detection system

York researchers have developed a technique that will enhance the **performance of magnetic resonance imaging (MRI) in identifying disease**. MRI and Nuclear Magnetic Resonance (NMR) are two of the most important techniques used in identifying simple molecules and complex materials and provide valuable information about how they behave. Applications in the diagnosis of a range of diseases, from cancerous tumours to heart disease, are particularly important. These technologies work by detecting the magnetic dipoles of nuclei, but in a typical hospital scanner, they effectively only detect one molecule in every 200,000. This makes it difficult in medical diagnostics to see the full picture of what is happening in the body.

### Green Chemistry wins H2020 Funding

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Our Green Chemistry Centre of Excellence (GCCE) has been awarded three-year Horizon 2020 funding as part of a multidisciplinary and multi-actor collaborative Research and Innovation Action (RIA) coordinated by Unitelma Sapienza University, Italy. The project STAR-ProBio aims to promote a more efficient and harmonized policy regulation framework, needed to promote the market-pull of **bio-based products** within the context of a sustainable 21st Century. This will be achieved by developing a fit-for-purpose modular sustainability scheme, linked to standards, labels and certification opportunities.

## Research Highlights

### Large spiroclip research grant

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Dr Will Unsworth and Professor Richard Taylor have been awarded £451,905 from the Engineering and Physical Sciences Research Council (EPSRC) to support research into "Spiroclip Technology: from Catalogue to Spirocycle in One Step". The main aim of this exciting research programme is to develop novel chemistry to make a diverse range of **complex spirocyclic structures** directly from simple catalogue starting materials. The new 'Catalogue to Complexity' concept will be based on the development of a new family of bespoke chemical reagents, known colloquially as 'Spiroclips'.

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### Tobacco-smoke residue that lingers in furniture, curtains and house dust can still be harmful

Dr Jacqueline Hamilton has written a piece on the harmful effects of tobacco-smoke residue for The Conversation UK. Each year about 600,000 people die from exposure to second-hand tobacco smoke. Once the smoke clears after a cigarette has been extinguished, nicotine and other harmful chemicals left behind can stick to surfaces and fabrics. This residue is known as third-hand smoke. There is growing evidence that **third-hand smoke contamination** is extensive and can linger for extended periods. Non-smokers can be exposed to third-hand smoke from breathing residual gases, touching surfaces and swallowing dust.

### Scientists develop new antibiotic for gonorrhoea

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Chemists and biologists at York have harnessed the therapeutic effects of carbon monoxide-releasing molecules to develop a **new antibiotic** that could be used to treat the sexually transmitted infection gonorrhoea. There are concerns that gonorrhoea, which is the second most common sexually transmitted infection in England, is becoming untreatable. Almost 35,000 cases were reported in England during 2014, with most cases affecting young men and women under the age of 25.

### Food flavour on a molecular scale

Dr Seishi Shimizu, in collaboration with Professor Steven Abbott of TCNF Ltd and Professor Matubayasi of Osaka University, has been measuring how much vanilla, almond or lemon flavour is bound to food macromolecules, which is crucial to understanding food flavour and aroma. For many decades, experimental data on flavour-food binding was analysed using chemical equations even though the dynamic and fluctuating nature of binding cannot easily be simplified in this way. Starting from the fundamental laws of **statistical thermodynamics** and fuelled by tea and coffee, the researchers wrote down a theory that can be used to capture such non-specific aroma-food interactions.

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## Athena Swan Celebrations

It is 10 years since we gained our Athena SWAN Gold Award. Throughout this year we are **celebrating this wonderful award**. There will be a series of events, culminating in a scientific symposium on 16 May at which the headline speaker will be Professor Carolyn Bertozzi, from Stanford University, USA.

## ChemSoc lecture

Academic staff shared their excitement over their own research in the first open lecture, organised by our undergraduate student chemical society, **ChemSoc**, in which undergraduates could find out more about research carried out in the department.

**Dr Seishi Shimizu** and **Professor David Smith** talked about recent results from their research teams, their shared fascination with interactions between molecules and their impact on real-world processes. Professor Smith said:

*York is one of the largest Departments of Chemistry in the UK, carrying out highly impactful research across a broad spectrum of science. Sharing our own research excitement with our undergraduate students was a genuine pleasure.*



## 2017 Award Winners

Professor Lucy Carpenter  
Royal Society of Chemistry  
Tilden Prize

Professor Peter O'Brien  
AstraZeneca,  
GlaxoSmithKline,  
Pfizer & Syngenta  
Process Chemistry Research

Professor Odile Eisenstein  
Royal Society of Chemistry  
Centenary Prize

Dr Jon Agirre  
Royal Society  
University Research Fellowship

Dr Richard Mandle  
British Liquid Crystal Society  
Young Scientist Prize



## York chemist wins prestigious Royal Society of Chemistry prize

**Lucy Carpenter**, Professor of Atmospheric Chemistry at the University of York, was awarded the 2017 Royal Society of Chemistry Tilden Prize. Professor Carpenter's work focuses on the emissions, chemistry, and impact of processes occurring in the atmosphere above the world's oceans. She uses a combination of field observations, laboratory studies, and theoretical modeling to help answer important questions about global climate change.

Professor Carpenter said:

*I am absolutely delighted and honoured to receive a Royal Society of Chemistry Tilden Prize, and very pleased that advances in chemical research in the field of atmospheric science have been recognised.*

## Excellence in teaching and supervision

The YUSU Excellence Awards present an opportunity to recognise and celebrate the work of teaching and support staff across the University of York. Entirely student-led, the Awards reward the teachers and staff that are making an outstanding contribution to students' lives. The Department has an outstanding record and, this year, **Ben Coulson** was awarded the 'Demonstrator of the Year' award.

## Funding boost for state-of-the-art equipment

The Department has been awarded £1.6 million to invest in state-of-the-art equipment used to investigate the three dimensional structures of biological molecules. The award, which will be used to invest in cryo-electron microscopy (Cryo-EM) equipment, was awarded by the Wellcome Trust. The funding will be matched with a £1 million gift from alumnus Dr Tony Wild – Dr Wild, a leading businessman and philanthropist, has been a long-time supporter of Chemistry at York.

Cryo-EM is a form of microscopy used by structural biologists in which biological samples are flash frozen to extremely low temperatures allowing them to be studied in the electron microscope in their native states – how they exist within a living cell. Cryo-EM is transforming areas of science essential for improving health, from seeing how drugs get into cells or visualising the atomic-level structure of a virus to aid vaccine development. **Professor Gideon Davies** said:

*Cryo-electron microscopy is one of the most exciting developments of recent years. We are looking forward to analysing the complex atomic structures of viruses and of proteins involved in human disease here in York.*

## Journal honour for Professor John Goodby

Emeritus **Professor John Goodby** has been honoured with a special edition of the journal, *Liquid Crystals*. The celebratory issue of the journal was published in honour of the professor's 65th birthday. It contains a collection of outstanding publications from leading scientists in liquid crystals from across the globe, including a number of contributions from colleagues at York, and a special article from Professor Goodby.

Dr Stephen Cowling, research fellow in the Department, organised the festschrift and took on the role as guest editor for the issue. He said:

*It was a great honour to be able to compile this special collection to help celebrate the 65th birthday of Professor Goodby – a colleague I have known and respected for over 25 years.*

In Pictures



Dr Glenn Hurst has been recognised as one of the top 10 UK **social media superstars** in a competition celebrating the excellent social media work being done in Higher Education



Replica posters for our year 3 MChem students who undertook a **process chemistry project**, making a blockbuster medicine called esomeprazole, kindly sponsored by AstraZeneca

green impact

University of York  
2016-17  
Gold  
Chemistry At York

Thank you to all in York Chemistry who helped us achieve a **Gold** in the University of York Green Impact Awards



BSc chemistry student, **Laura Berga**, was one of 25 students to receive a Laidlaw Undergraduate Research and Leadership Scholarship. This is a new programme that equips undergraduate students with the skills to become leaders in their chosen occupations.



Visitors from K9 fi, a not for profit company that has specialist fire investigation dogs that work for the Fire Service and police, during the summer term. **A great break from revision** for our students with an informative talk and cute dogs!



The University of York teddy bear is on the cover of an issue of the journal *Chemical Communications*. The design was inspired by the **Dr Alison Parkin** group's review of their recent advances in developing a transformative new technique for bioelectrochemistry



With over **175 videos on YouTube**, first year York Chemistry Students have, over the past 7 years, created one of the most diverse sources of online educational material in the field of polymer chemistry



A **chemis-tree** appeared in our teaching labs at the end of November

Exploring Everyday Chemistry



One of our **student ambassadors** in action on a September Open Day



Many congratulations to our first year Chemistry students who have been awarded **departmental sponsorships**



## Intern of the Year

A final year York Chemist has won Intern of the Year for her innovative work with North Yorkshire Police.

**Tanya Bayley** won the accolade following a 12-week internship working with police to look at ways the force could better utilise their current equipment; such as laptops, computers and mobile phones.

Tanya's report produced 20 recommendations, nearly half of which have been assessed and agreed for implementation, with the rest currently being considered. Tanya received her award at a special celebratory event at Heslington Hall, which was attended by local businesses and University staff and students.

## Snapshots



Dr Alison Parkin explains how her research is exploring new ways to **GENERATE ENERGY** at YorkTalks 2017 ([https://www.youtube.com/watch?time\\_continue=1&v=-bgLfHIOtL4](https://www.youtube.com/watch?time_continue=1&v=-bgLfHIOtL4))



**MAGNIFY THE STUDENT EXPERIENCE:** Take a look at our new Magnify website – students help us address areas of interest to applicants (<https://www.york.ac.uk/chemistry/undergraduate/newstarters/magnify/>)



Animation video created by Digifish to showcase **CHEMISTRY AT YORK'S AWARDS, ACCOMPLISHMENTS AND RESEARCH** ([https://www.youtube.com/watch?v=4056Mkv\\_tmQ](https://www.youtube.com/watch?v=4056Mkv_tmQ))

## Come and visit us

Our visit days offer an excellent opportunity to find out about the University of York. Most importantly, you'll be able to get a **'feel'** for the University, which will help you decide whether or not York is somewhere you'd like to spend your university years.

### 2018 Pre-application Visit Days



Over the summer we will be holding two Departmental Open Afternoons for prospective Chemistry students. Please see our website for further information and booking.

Each visit day will involve a free lunch for all guests, a tour of the department's teaching and laboratory facilities, a college tour, an opportunity to chat informally to members of staff, as well as opportunities to meet our current students and talk to them about what it is like to live and study at York.



*The Chemistry department went out of their way to present their department and course, and why to choose to study chemistry. They covered everything possible.*

Visit Day quote 2017



### 2018 University Open Days



The University will be holding Open Days on **Fri 29 June, Sun 1 July, Sat 15 September, and Sun 16 September.**

For further details including booking: [www.york.ac.uk/study/undergraduate/visits/open-days/](http://www.york.ac.uk/study/undergraduate/visits/open-days/)

We have organised a number of talks in the Chemistry Department during the day and you will also have the opportunity to have a **tour of our teaching and research laboratories.** Members of the admissions team and current undergraduate Chemistry students will also be on hand.

Our Open Days in 2017 were extremely well attended and we received some **excellent feedback** from visiting students and their parents.

### Student Finance

[www.york.ac.uk/students/finance/](http://www.york.ac.uk/students/finance/)  
[www.gov.uk/browse/education/student-finance/](http://www.gov.uk/browse/education/student-finance/)

The University's Student Financial Support Unit will be able to help with any student financial queries that you may have.

### Student Societies

[www.yusu.org](http://www.yusu.org)

York University Students' Union (YUSU) offers an array of societies covering a huge range of activities ranging from the Juggling Society to award-winning media societies.

### Student Sports Clubs

[www.yusu.org/opportunities/sport/clubs-a-z](http://www.yusu.org/opportunities/sport/clubs-a-z)

Enjoy more than 60 different sports clubs.

### University Library

[www.york.ac.uk/library/](http://www.york.ac.uk/library/)

The Library has recently been transformed with a £20 million investment and is open 24 hours a day, 7 days a week, 362 days a year.

### Chemistry Review

[www.york.ac.uk/chemistry/schools/chemrev/](http://www.york.ac.uk/chemistry/schools/chemrev/)

*Chemistry Review*, a magazine for post-16 chemists, is commissioned and edited at York.

### Departmental video links

<https://www.youtube.com/watch?v=iOuk9wlnfJI>

... to show how our Reach Out Chemistry York (ROCy) project aims to engage with prospective Chemistry undergraduates.



<https://www.youtube.com/watch?v=WBM2fxSVpXc>

... for a short clip about our new teaching laboratory, with its 80 two-person fume hoods, dedicated instrument rooms, and an adjacent social area with a computer suite.



Find out about the latest news in the department using twitter: <http://twitter.com/chemistryatyork>

### Admissions Enquiries please contact:

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