



The
University
Of
Sheffield.

Chemistry

Newsletter

CHEMISTRY NEWSLETTER 11

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Top of the class

It is always nice when the University receives accolades, but it is especially gratifying if those accolades come from our own students - after all, they do know us the best. So we were very happy to see that in the latest *Times Higher Education Student Experience Survey*, which is compiled from votes received by students at Universities throughout the UK, we were voted the top university within The Russell Group of research intensive universities and the best in Yorkshire and Humberside.

In fact, Sheffield scored highly in many of the twenty-one categories of the national survey, coming top or joint top in library facilities, social life, quality of the Student Union, and extracurricular activities.

One interesting national trend that emerges from the survey is that students on Physical Science courses, like Physics or Chemistry, were generally more satisfied with their courses than students studying other subjects.

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Chemistry at Sheffield

With an annual intake of around 160 – 170 talented undergraduate students a year, Chemistry is one of the biggest departments in the University of Sheffield. Our Undergraduate students are drawn from four different continents. Find out more at:

<http://www.shef.ac.uk/chemistry/>

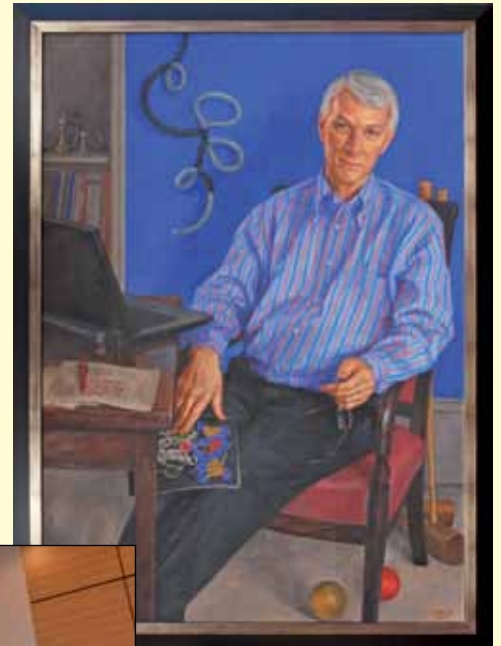


A Nobel Portrait

Nobel Laureate Prof Richard Roberts, who was an undergraduate and PhD student in the department, and one of the three Nobel Laureates directly associated with Chemistry at Sheffield, recently made a return visit to unveil his portrait. The painting, commissioned by the University of Sheffield as part of the *Arts/Science Encounters Project* to promote cross-discipline research and collaboration at the university, celebrates the career of one of the UK's most distinguished scientists.

Painted by renowned portrait artist Juliet Wood, the portrait offers many visual insights into Rich Robert's research interests and hobbies. The black and white rubber tube in the background alludes to Prof Robert's Nobel Prize-winning discovery of "split genes" – the fact that DNA gene sequences that form part of the genetic code are found in segments separated by non-coding sections of DNA. The picture on his lap is the structure of another of his discoveries: the enzyme cytosine-5 DNA methyltransferase, flipping out a cytosine base from a DNA double helix so it can be chemically modified by the enzyme. Rich's love of chess and crossword puzzles are also illustrated, and - if you take the hints shown beneath his chair - you wouldn't be surprised to discover the full size croquet lawn right outside his house.

Juliet revealed that Prof Roberts's hectic international work schedule, meant that it was difficult to find slots for his sittings for the portrait: "one of the four sittings had to be carried out in Heathrow airport." However, the subject declared that he was very happy with the results: "and more importantly, my wife really likes it too." The picture was unveiled in January by Prof Roberts at a ceremony, which was also attended by Juliet Woods. It now hangs on display at the entrance of the Richard Roberts auditorium of the Chemistry Department.



Above
Portrait of a Nobel Prize Winner

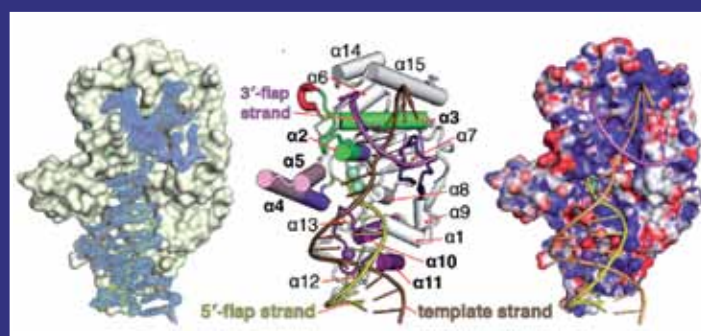


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Model and Artist admire the finished work

Flip flapping about in cells

Richard Roberts's pioneering work on base flipping (see a Nobel Portrait) plays an important part in a recent research paper by Dr Jane Grasby, a Reader in Chemical Biology at our Department. Published in the prestigious journal *Cell*, the paper provides an insight into the complex molecular machinery used by cells when they get ready to divide.

Since all the blueprints for a cell are locked in DNA's genetic code, one of the first steps in cellular reproduction is the production of duplicate DNA copies. Kick starting this process requires a short template of another nucleic acid, RNA, which is chemically tethered to the growing DNA strand.



The structure of the flap endonuclease bound to DNA

As the DNA replication process progresses the flap of now redundant RNA is removed by an enzyme known as a flap endonuclease, which then allows strands to come together to form the familiar double helix. During the replication of a single cell this last process has to be carried out with absolute precision around 50 billion times; any mistakes by the enzyme will damage precious genetic information locked in the DNA strand.

Working in collaboration with researchers at the prestigious Scripps Institute in La Jolla, California, the Grasby group has been investigating how flap endonuclease goes about its work and they have discovered that the RNA is cut from DNA strands by a mechanism which also involves base flipping.

Since these enzymes have such a key role in cellular replication, an understanding of how they work may have medical implications. For example, it may be possible to design new molecules that will bind to the enzyme and disrupt their natural function. As Jane points out: "By inhibiting the function of flap endonucleases, new therapies for cancer or antibiotics may emerge."

One Hundred Not out

Our Head of Department, **Prof Mike Ward**, reached a significant landmark in February. While the ambition of many research scientists is to publish a hundred papers, Mike has just notched up a century of publications in a single journal.

The Royal Society of Chemistry's Dalton Transactions publishes international research into inorganic chemistry and has also been the home of several of Mike's personal career milestones. It published his very first research paper as a PhD student and a few years later it also published Mike's first work as an independent researcher. *Dalton Transactions* chose Mike's hundredth paper as a cover feature and The Royal Society of Chemistry produced a press release to celebrate this significant milestone. Prof Ward is an enthusiastic supporter of the journal anyway: "although an international journal, Dalton Transactions has always published much of the best home-grown inorganic chemistry and has helped to give UK chemistry its international reputation"



A cover feature celebrating Prof Mike Ward's century of papers

Graduate Teaching Fellowships

As part of our commitment to teaching, the Department of Chemistry has recently created an innovative Graduate Teaching Fellowship scheme. Funded by the department itself, the fellowships are specifically designed for research students with a particular interest in teaching. Graduate students appointed to these four-year posts register for both a PhD *and* a postgraduate teaching certificate. During their time at Sheffield the appointees will not only carry out research in world-class labs, but also – through a variety of tutoring and demonstrating activities - gain considerable experience in teaching chemistry at the highest academic level.

The first three Fellowships were awarded to **Cankut Ankut**, **Christopher Parks**, and **Richard Plendeleith**. We welcome their contribution to the Department's first-class team of teachers

We welcome our three new Graduate Teaching Fellows



Cankut Ankut



Christopher Parks



Richard Plendeleith

Further information on all the courses the department offers can be found at its web site:

<http://www.shef.ac.uk/chemistry/>



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News

Chem

Alumni

Are you an Alumnus of the
Department?

We would really love to know how you are getting on. Tell us your news and we will share it with our readers. Send your stories and photos to chem-alumni@sheffield.ac.uk and we will endeavour to include your information in future editions of this Newsletter



Further information on all the courses the department offers can be found at its web site:

www.shef.ac.uk/chemistry/

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