

## welcome to issue 32

How's the revision going? Keep going, the exams will be over soon! It'll be worth it when you get your results later in the year and realise that you have the grades you needed to gain a place at your first choice university. This month, in addition to your regular

copies of Chemistry World, InfoChem and ChemNet News we have included an article written by a student whose hard work for her chemistry exams

last year won her a trip to Boston, USA courtesy of the RSC and Shire Pharmaceuticals plc. There were six winners of the competition in total last year. Their hard work was rewarded with a trip which included a visit to Shire Pharmaceuticals, tours around the Massachusetts Institute of Technology (MIT) and the Harvard Campus as well as the chance to explore the city of Boston itself. Will it be your turn to win this year? More information at

[www.rsc.org/shireprize](http://www.rsc.org/shireprize)



Robert Bowles – Editor



## Chemistry in Biotechnology

### CAREERS SPOT

Biotechnology is the use of biological systems or organisms to produce products or processes of value to us. It is used in everything from food and drink production, environmental cleanup right the way through to the production and modification of therapeutic molecules. There are many opportunities for chemists in this sector. Chemists are involved in the research, analysis and production of these products and often use them as precursor molecules which can be chemically modified for specific uses. The latest developments in

biotechnology using chemistry range from protein separation techniques to combinational chemistry. It's a rapidly changing industrial and research sector which continues to offer fantastic career opportunities for chemists.

[www.bio.org](http://www.bio.org)  
<http://www.biotechinstitute.org/careers>



## Website of the month

If you're serious about applying for a chemical science course or just considering it as one of a number of options you really need to come to Meet the Universities in July. [www.rsc.org/mtu](http://www.rsc.org/mtu)

## chemnet events

Many ChemNet events have now been confirmed for 2009. Just go to [www.rsc.org/chemnet](http://www.rsc.org/chemnet) and click on ChemNet events on the left hand side, then click on forthcoming events for the full listing and to see if there are any events near you.

### Meet the Universities

THE ChemNet event in 2009. [www.rsc.org/mtu](http://www.rsc.org/mtu) for more information including a full listing of the universities attending, and to book your place online. Places are limited so make sure that you register soon. **4 July 2009**

### ChemNet at the Bank of England

**Off Threadneedle Street, London**  
The applications of chemistry in producing banknotes and how to thwart counterfeiters using nanotechnology. **7 May 2009**

### ChemNet Nanotechnology day at University of Liverpool

A day of nanotechnology and materials chemistry, with a hands-on practical session where you can make a sample of gold nanoparticles in the undergraduate labs. **25th June 2009**

### ChemNet at Sheffield Assay Office

Learn more about the analysis and hallmarking of precious metals from the people who have been doing it for over 200 years. **1 July 2009**

## chemistry on the web

A website for all advanced chemistry students which covers all areas of chemistry and the different exam specifications. It's packed with tests, tutorials and handy question and answers sections.

[www.chemistry-react.org](http://www.chemistry-react.org)



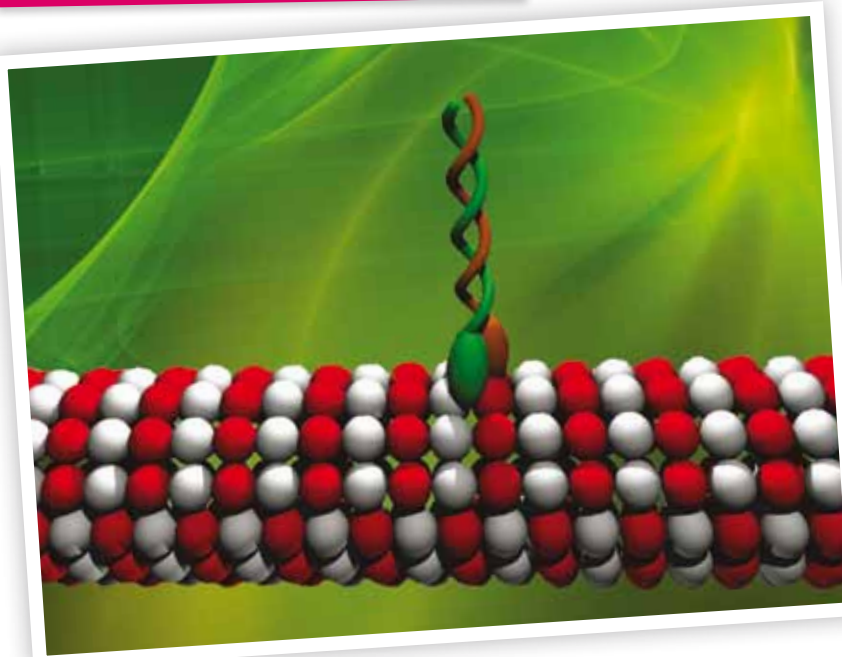
Wikipedia continues to be a great source of information in some areas. They've got a great overview of the uses and applications of biotechnology through history. They have a lot more space than we have here in ChemNet News.

[http://en.wikipedia.org/wiki/History\\_of\\_biotechnology](http://en.wikipedia.org/wiki/History_of_biotechnology)

If you need a bit of last minute revision this month the RSC is happy to oblige by providing some selected links to sites which may be useful: [www.docbrown.info/](http://www.docbrown.info/) [www.s-cool.co.uk](http://www.s-cool.co.uk)

If you want to register to use the discussion board email [chemnet@rsc.org](mailto:chemnet@rsc.org)

## Chemistry in the news



### Chemists take a big step forward in molecular motor research.

Tiny molecular motors are being researched which use strands of DNA and a protein called kinesin to make bipedal walkers which can move a long a specific track, 49nm wide. It's an interesting story about research into the design and production of tiny molecular motors, but what really caught my eye was that it is filed under the biotechnology news section of the website but the headline contains chemists! This highlights the power of chemistry as a subject, how in this case it has brought together aspects of biology through the structure and function of DNA, with nanotechnology and engineering.

<http://www.sciencedaily.com/releases/2009/04/090402143507.htm>

### Viruses not included

The production of batteries has always been the domain of chemists but now they're getting help from virologists. Harmless viruses called bacteriophages have been genetically altered so that they can now be used to form anodes and cathodes in batteries by getting cobalt oxide and gold ions to adhere to them.

The cathode is formed by getting the viruses to adhere to carbon nanotubes. This technology for battery manufacture has much better environmental credentials than traditional methods as all the materials used have to be safe so that they don't kill the organisms being used. These batteries are still a work in progress but are another great example of nanotechnology. The technology needs to be developed further before successful commercialisation but it's a tantalising glimpse into the future

<http://sciencenow.sciencemag.org/cgi/content/full/2009/403/1>

<http://news.bbc.co.uk/1/hi/technology/7977585.stm>

These stories both have the common theme of using biological systems to produce technology that is of use for humans. In recent times the phrase "biotechnology" has become synonymous with so-called genetic engineering- the use of recombinant DNA technology, but in fact biotechnology stretches back much further to the dawn of human history. Early examples of biotechnology include brewing and the production of dairy products such as cheese and yoghurt.

“To book a place on a ChemNet event email: [chemnetevents@rsc.org](mailto:chemnetevents@rsc.org) or call 01223 432340”

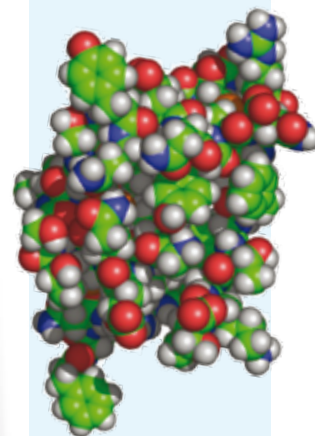
### HAVE YOUR SAY!

Would you like to see your article in the next issue? If it's good enough we'll print it! Submit your article to [chemnet@rsc.org](mailto:chemnet@rsc.org)

### CHEMISTRY FACTS

160 drugs and vaccines have been produced using biotechnology which is now a \$30 billion a year industry. Currently there are more than 370 biotech drug products and vaccines in clinical trials targeting more than 200 diseases, including heart disease, cancer, diabetes, AIDS and arthritis.

## free stuff!



Last month's winner of the £20 HMV voucher and MolyMod kit was Faiqa Nasir from Crawley. Well done to Faiqa, who correctly answered that cephalosporin was first isolated at Oxford University. Your prize is on it's way. This month we have prizes of a £20 HMV gift voucher and a MolyMod kit. Text us on **07825 186304** with the answer to this question:

*The first genetically-engineered, synthetic "human" insulin was produced in a laboratory in 1977 by Genentech using which microorganism?*

You can also answer by email [chemnet@rsc.org](mailto:chemnet@rsc.org) Closing date 8th May.

