

# Biochemistry, Genetics & Microbiology

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## NEWSLETTER

2013

**IBERS** Institute of Biological,  
Environmental and Rural Sciences

## Student Biochemistry Conference

This year the Aberystwyth Biochemistry Society secured funding for and hosted the first All-Wales student biochemistry conference. With funding from the Biochemical Society, a day of events was organised, including research seminars, a guest plenary speech and careers workshops. Dr. Tom Clarke came from the University of East Anglia to talk about bacterial nanowires, Dr. Paul Kenton ran a biochemistry-focused careers workshop, and young pharmacologists visited from Swansea Medical School to discuss careers in medicine. PhD students talked about their research projects to a largely undergraduate audience, and on a wide range of topics, from bioprocessing to cancer biology. Organised for students by students, it was an exciting day and a credit to the organising team.

## Numbers of students studying 'molecular bioscience' continue to increase



A third Year Microbiology student hard at work in the lab.

After having welcomed 56 new first year students to Aberystwyth last year to study Genetics, Microbiology and/or Biochemistry, 76 began their studies this year. There are now nearly 150 students at Aberystwyth currently studying for degrees in Genetics, Microbiology and/or Biochemistry - around three times the number of students that were studying for the same degrees only 5 years ago. Such an increase in student numbers has enabled us to develop innovative teaching sessions on key 'molecular' topics, and allowed a community of 'molecular bioscience' students to coalesce as a distinct group within the Department. We're committed to helping this community flourish over coming years and are looking forward to working with the students to further develop exciting opportunities within their courses.

## Biochemical Society Prize awarded to Aberystwyth Student



Michal Flak and Professor Will Haresign

The professional society for UK biochemists, The Biochemical Society ([www.biochemistry.org](http://www.biochemistry.org)), has granted a prize to an IBERS student for success in his studies in biochemistry. The prize was awarded by Professor William Haresign, IBERS Deputy Director to second year student Michal Flak. Dr. Dave Whitworth, Lecturer in Biochemistry and Local Ambassador of The Biochemical Society said 'It's great that The Biochemical Society could provide a prize so that we could reward one of our students for their pursuit of biochemistry. Michal has made excellent progress in his studies, and I hope that this public recognition spurs him to further success.'

## More degree success for Biochemistry Students

This summer we celebrated the graduation of another exceptional cohort of students. Ten of the 26 IBERS graduates that were awarded first class degrees were studying biochemistry, genetics and/or microbiology, despite these degree schemes only representing 1/7<sup>th</sup> of the student body. Many of our graduates this year have also started PhDs or MSc in life science research and we wish them well in their new careers.



## List of Courses

### BSc

Biochemistry C700  
Genetics & Biochemistry CC47  
Genetics C400  
Microbiology C500  
Zoology & Microbiochemistry CC35  
Life Sciences C990

### Interested?

Phone **Chantal Thomas** on **01970 621904**  
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## Polish Scientist goes FISHing with Students



Prof Rob Hasterok of the University of Silesia

Professor Rob Hasterok of the University of Silesia (Poland) visited IBERS in October 2012, and showed second and third year undergraduate students the power, practicalities and applications of a versatile molecular cytogenetic technique known as fluorescent *in situ* hybridisation, or FISH for short. This modern laboratory tool enables us to label nuclei or chromosomes with specific, fluorescent DNA tags, and helps us to understand the structure, evolution and behaviour of genomes. Rob has a longstanding research collaboration with Dr Glyn Jenkins (IBERS), and is also our partner in a fruitful Erasmus link between the two universities. This relationship enables the movement of staff and students in both directions, and provides a golden opportunity for undergraduate students to gain valuable work experience in a foreign laboratory.

Chromosomes of the Welsh Onion (*Allium fistulosum*) with centromeric (pink) and telomeric (green) FISH tags





Professors Pungartnik and Brendell being shown the Beacon project labs at Gogerddan by Dr. Bernd van Houten

## Visitors from Brazil to save the Mars bar

Professors Cristina Pungartnik and Martin Brendell from UESC (Universidade Estadual de Santa Cruz) in Bahia, Brazil visited IBERS over the summer. Cristina and Martin work on Witches' broom disease of cacao (WBD; caused by the fungus *Moniliophthora perniciosa*), which has crippled the economy of southern Bahia, since it arrived there in 1989. More than 100,000 people lost their livelihoods due to the arrival of the fungus which resulted in Brazil becoming a net importer of cacao, having previously been the world's third largest exporter.

The purpose of their visit was to undertake some work on this fungus with Drs. Gareth Griffith, Luis Mur and Ian Scott. This Brazilian connection goes back to the 1970s when the late Paolo and Ronaldo Alvim undertook work on cacao physiology here. Indeed, Paolo's daughter, Dr. Fatima Cascardo, who also works on WBD at UESC was born in Aberystwyth.

Cristina and Martin were also able to visit various labs in IBERS. Since Brazil is a world leader in bioethanol production, they were particularly interested to see the Beacon project at Gogerddan. This visit would not have been possible without funding from the British Council and the tireless efforts of the AU International Office.



A terrible beauty - *Basidiocarps* of *Moniliophthora perniciosa*

## New Microbiologist Lecturer Appointed

In September Dr Sharon Ann Huws accepted a lecturing post within IBERS in animal science, funded by the Coleg Cymraeg Cenedlaethol. Sharon was brought up on a farm in Cardigan, South Ceredigion. After completing her A levels at Cardigan Secondary School she obtained a degree in Zoology from Bangor University in 1998. She then undertook an MSc in Parasitology and Entomology at Liverpool University before moving to Manchester University to undertake a PhD investigating the interactions of protozoa with microbial communities. Sharon was successfully awarded her PhD in 2003 and went on to a post-doctoral post at Bath University where she studied the interactions of pathogens with protozoa. She then joined the Institute of Grassland, Environmental and Rural Sciences (IGER) to work as a rumen microbiologist. When the institute merged with Aberystwyth University in 2008, forming IBERS, Sharon and her group continued to concentrate on the rumen. Sharon uses the latest technology, such as genomics, metagenomics and metatranscriptomics, in order to answer central questions relating to the functionality of rumen microbes in order to ensure future availability of milk and meat of the best possible quality. As a consequence of Sharon's employment, IBERS now offers many more modules through the medium of Welsh, which makes most of our degree schemes eligible for the Coleg Cymraeg Cenedlaethol's undergraduate scholarships. We all welcome Sharon to her new position and wish her every success in both her teaching and her research.

## Microbiology Quiz Night

A hotly fought contest took place on December 4<sup>th</sup> at the Students' Union. The occasion was a Microbiology Quiz which also provided an opportunity for undergraduates on the Microbiology (C500) and Zoology/Microbiology (CC35) degree schemes to meet students from other years, as well as some of our current PhD students. The victorious team were rewarded with cuddly Giant Microbes. Thanks go to Marikka Beecroft and Tamsyn Gregory for their organisational prowess.



The victorious team with their microbes: Jen Dix (Salmonella), Lucy Willis (Chlamydia) & Dean Simcott (Ebola virus).

## An international student's visit to IBERS – Clemence Poncon

This summer, I had the pleasure of staying in Aberystwyth, as a visiting student from France. For my Masters in agriculture, I wanted to gain work experience in a research center. I was given a project in IBERS, under Dr. Gordon Allison's supervision, investigating compositional differences between ecotypes of *Brachypodium*, a small grass growing around the Mediterranean Sea which would serve as a genetic model for energy crops. I coordinated experiments which generated large amounts of data, which were analysed to see whether compositional differences correlated with the region where the plants were collected.

In addition to the fact that this project was very interesting, I have excellent memories of my stay in Aberystwyth. I was quickly integrated in a group of students with whom I went to pubs, walked on the sea front or visited the countryside. The city is in a wonderful setting, right next to the beach and surrounded by the green hills. In addition, I had the pleasure to meet very friendly and welcoming persons. You can never be bored in Aberystwyth, as there are many things to do. The University Sports Center offers a lot of activities such as zumba classes, or pool sessions. For those who like outdoor activities, you can go surfing in Borth or Ynys Las, or hike with the "Aberystwyth rambblers" in Snowdonia National Park and in the amazing Welsh landscape. And when it's raining (yes it happens sometimes!) just go to the Arts Center, or to one of the numerous pubs in the city! Those three months were a wonderful experience, and I would encourage everybody to come to Aberystwyth!



Dr Hazel Davey, Microbiologist

## Excellent Teaching

Here in IBERS we take excellence in teaching very seriously. New lecturers undertake a postgraduate teaching qualification and all staff take part in staff development training courses on a regular basis. In 2012 Aberystwyth students from all university departments voted in the Student-led Teaching Awards and they selected IBERS lecturer and microbiologist Dr Hazel Davey to be the recipient of the award for the Technology-Enhanced Learning. Hazel was also awarded an Aberystwyth University Learning and Teaching Fellowship in 2011. The awarding panel highlighted her use of "initiatives and innovations that have improved student learning". Professor Will Haresign, Deputy Director of IBERS, said: "The Institute places great emphasis on teaching excellence, and these awards by the University are very competitive. It just goes to prove how dedicated our staff are in their pursuit of teaching excellence, and this is clearly reflected in the student learning experience, something that is evident from our excellent results in the National Student Satisfaction Survey over recent years". If you are studying growth of microorganisms as part of A levels then you might like to try out some of the web resources that Hazel has made available to students here:

<http://users.aber.ac.uk/hlr/mpbbb/>

## More undergraduate research published

Undergraduate project research was published in the prestigious international journal *Microbiology* in November with a related image gracing the journal's cover. The work of three third-year project students focused on the social and predatory bacterium *Myxococcus xanthus*. The students who were studying towards degrees in Biochemistry and Genetics with Biochemistry discovered that the bacterium killed its prey by releasing antimicrobial chemicals packaged together into little parcels called vesicles. The vesicles can then fuse with a prey cell, releasing digestive enzymes into its interior and killing it. The research paper was also accompanied by a cover image for the journal depicting vesicle-mediated predation. The third year project is one of the crowning elements of Bachelor degrees in IBERS, when students get the option to work alongside staff undertaking novel research.



Illustration used on the front cover of the November edition of 'Microbiology'

The project students were supervised by Dr David Whitworth, Lecturer in Biochemistry. "It's a thoroughly rewarding experience to guide students through their project, but when their work is acknowledged as being of international quality through publication in the professional literature, then it gives a real boost to all of us, and will hopefully spur the next steps in those students' careers. It's also a visible demonstration of the importance that we put into the mutually beneficial relationship between research and teaching at Aberystwyth." Two of the three students have gone on to study for PhDs across the UK, while the third is currently working in an analytical laboratory.

## New Practical Modules

For the first time this year, our first year students took a completely new practical module, focusing on the manipulation of DNA and cloning. In the Molecular Lab Skills module, students undertook a practical each day, throughout the first week of the second semester. For the remainder of the semester, students then explored the theory and results of the experiments as small groups with their academic tutor. Second year Microbiology students will also benefit from a new entirely laboratory-based module 'Practical Skills in Microbiology'; this year, a counterpart to the corresponding modules for Biochemistry students 'Practical Skills in Biochemistry' and 'Biochemistry in Practice'.



Loading a DNA electrophoresis gel during the Molecular Lab Skills first year module