

Biochemistry, Genetics and Microbiology Newsletter 2020

List of Courses

BSc

Biochemistry
 Genetics
 Genetics & Biochemistry
 Life Sciences
 Microbiology

MBiol

Biochemistry
 Microbiology

Interested?

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IBERS Institute of Biological,
 Environmental and Rural Sciences

Student Innovation Success

During the summer, final Year Biochemistry undergraduate Eleanor Wilson won the 2019 Telegraph STEM Awards. Eleanor's third year research project, with Dr Hazel Davey, looked at the use of CRISPR gene editing technology in a novel way – to identify disease rather than to edit genes.

Developing her project ideas further, Eleanor came up with a way to potentially detect the presence of particular DNA sequences – in this case sequences diagnostic of Mycobacterium tuberculosis, the causative agent of TB.

Eleanor's idea won the GlaxoSmithKline Healthcare category of the Telegraph STEM awards, before going forward to the final round. Pitted against four other category winners at a high profile London event, Eleanor's idea won the overall prize. Eleanor said after receiving the award "I've had a crazy, innovative idea and I've run with it, and all these experts in the field have said: 'Yeah, that could work.' This will open up so many opportunities."

A Tweet from GlaxoSmithKline shows Eleanor (centre), receiving her prize at the Telegraph STEM Awards ceremony.

STEM Awards Retweeted



GSK @GSK · Jun 14

Congratulations to Eleanor, the overall winner of the Telegraph STEM Awards for her healthcare category submission, using a CRISPR based system for diagnosing TB @STEMawards #globalhealth #innovation @RachelRileyRR



Learning about the useful microbes

When members of the general public hear the word microbes they often think of disease. However, most microbes are not harmful and indeed, many of them are useful.

Biotechnology is the technological application of biology. This includes the traditional use of yeast to make bread and beer as well as modern methods of manipulating organisms to produce chemicals of our choice, like antibiotics.

We have introduced a new module into third year to enable our Biochemistry, Genetics and Microbiology students to learn about this important field of study. Students recently worked in groups in the laboratory to design an experiment to follow the progress of a fermentation gaining essential skills for working in the pharmaceutical or brewing sectors. We were also visited by a local company that sells instruments worldwide for monitoring cell concentration in such processes. Through sessions such as these we ensure our graduates use cutting-edge technologies and that they develop important employability skills.

Year in Industry

Our BSc degree schemes in Biochemistry, Genetics and Microbiology are available as 4 year version with an integrated Year in Industry.

This year, students on those schemes were placed with diverse biotech companies including Micropharm, Biocatalysts, and The Catalan Institute of Oncology (Spain). Year in Industry placements increase employability, starting salary and increased job security (The Wakeham Review). The quotes below from students currently on placement show why:

“

“My placement is laboratory based so the experience I have gained has been mainly skills based. I have learnt how to set up cytotoxicity and trypsin assays, handle liquid nitrogen, calibrate pipettes and how to use various other pieces of lab equipment. But additionally I have learnt how to present my findings in meetings and write standard operating protocols for others to understand.”

“

“I am now fully confident with handling most laboratory equipment and machines, skilled in several assay procedures focussing on enzyme manufacturing and development. My communication, time management, organisational skills have improved significantly. I am always encouraged to understand the science behind every assay we perform, and this has made working in a laboratory very interesting for me while exploring the wonders of science.”

“

Alysson Turcios is currently on placement as part of her degree (BSc Hon Genetics and Biochemistry) and is an ardent advocate of the Year in Industry. She says:

“I’m currently in my Year in Industry in the Catalan Institute of Oncology, working with a translational research group and preparing my first publication. It wouldn’t have been possible without the support of the Careers Service, Industrial Year Co-ordinator and Erasmus Office who helped me with each application and encouraged me to keep applying until I got a position. I strongly recommend doing a placement, because it’s the best way to firm up your career choice.”



Alysson in the laboratory during her Year in Industry placement

BIOCATALYSTS
exceeding enzyme expectations

Generalitat de Catalunya
gencat.cat

Institut Català d'Oncologia

MicroPharm

Thermal conversion of wood into industrial chemicals and fuel

Weronika Zapalska, a final year undergraduate student studying for an MBiol in Biochemistry at Aberystwyth University is researching the influence of wood and tissue type on the thermal decomposition of timber grown in the UK, with a view to using forestry as a non-fossil source of chemicals. One way in which we can utilise wood is thermal conversion, where heat is used in the absence of air to break the biomass down to produce gases, liquid and char. These products can then be taken on to further chemical transformations to produce e.g. aviation fuel, but little is known about how feed stocks affect the efficiency of these processes.

Weronika’s project involves multiple analytical approaches, including thermogravimetry and infrared spectroscopy to characterise the starting material, and the gases produced during thermal decomposition. Weronika will then begin modelling of her complex data to uncover chemical relationships between starting materials and products. Weronika and her supervisor Dr Gordon Allison are optimistic that work from the research project will soon be published in the scientific literature.



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