Bioengineering news

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THE LEADING DEPARTMENT OF BIOENGINEERING IN THE UK

Head of Department's message

by Professor Anthony Bull

Bioengineering - A cultural experience?

Most academics at Imperial College London are driven, busy, hard-working, focused, and successful. It is, therefore, refreshing to see that some in this Department manage to find a balance between this success in strict academic terms, and their wider contribution through academic-related activities. A number of these are recorded in this newsletter. For example, the Department is seen to be a strong supporter of the Imperial Fringe series of events, yet this is not top-down support as our colleagues have themselves taken the initiative to engage with these public events. I am sure that they, like I, see the knock-on benefits far outweighing the cost in terms of time.

From Australia to Queen

Bioengineering can also take you to many different unexpected places and meet some interesting people. For example, Imperial's long-standing connection with Queen is known, yet how many of us get to meet the band?

During one of the coldest and wettest winter on record, why not ensure that your work takes you to Australia? These opportunities all arise out of being at the heart of a great city, in a great university, with great colleagues and students. Please don't take my word for this; this week the three external examiners for our undergraduate degrees visited the Department. They spent a day meeting with staff and students and provided rich feedback to the Department that can be summarised as this:

- We have great students who are happy with the courses, course management, and teaching.
- The Department is highly responsive to students and the external examiners.
- Our new initiatives this year are working, including, in particular our new approach to first year maths teaching.

Thank you all for making this a fantastic place to work and study.

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Life as we know it

Read all about the Department's participation in the latest Imperial Fringe event.

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Rock royalty

Undergraduate Aislinn Hayes met with rock gods Brain May and Roger Taylor when they visited College to accept a music heritage award from the Performing Right Society for Music. Read all about her evening. Images courtesy of Slobodan Radosavljevic.

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Visitors experience frontier science at latest Fringe event

by Maxine Myers

How synthetic biology can be used to improve our everyday lives was the theme of the fifth in the series of free Fringe events at the College.

Synthetic biology is the manufacture of biological materials, such as chemicals or enzymes, through engineering processes. It is predicted that by 2016 the world market for synthetic biology products, will be £16 billion and could have the potential to aid the growth of the UK's economy.

"Life as we know it" was a public evening drop-in event that took place at Imperial's Main Entrance on Exhibition Road.

Fringe-goers had the opportunity to participate in a range of interactive demonstrations at the festival including a presentation about the difference between modified and natural tomatoes. Dr Stuart John Dunbar, from the Syngenta University Innovation Centre at Imperial, gave visitors the chance to taste three different varieties of tomatoes with varying sweetness and asked them to rank the tomatoes in order of their preference to explain the varying tastes of shoppers. The sweeter tomatoes proved the most popular with visitors. The Centre is looking to replicate the genes in the sweeter tomatoes and implant them in conventional tomatoes for a better flavour. Dr Dunbar also treated visitors to some of his tomato trivia, including the fact that tomatoes lose 50 per cent of their flavour within 15 minutes of being placed in the fridge.

In another display, students from the Department of Life Sciences created a mock fridge to show how synthetic biology can be used to conserve food in the fridge. They discussed how microscopic biological sensors could be stuck onto food packaging like plasters to detect when food is spoiling to safeguard food quality and minimise waste.

Students Nicholas Kral and **James Field** from the Departments of Life Sciences and Bioengineering also discussed how synthetic biology could be used to prevent soil erosion. They talked about how harmless bacteria could be re-engineered to produce a plant hormone that would promote root growth to protect plants from being upturned and washed away in flash floods.

Other demonstrations included synthetic biologist **Dr Tom Ellis,** from the Department of Bioengineering looking at changing the texture and taste of beer by engineering yeast, so that it is easy to extract in order to make beer crisper and clearer. This new process could potentially save breweries money.

Benjamin Reeve, from the Department of Bioengineering, also demonstrated ways of turning compost into biofuels, which is important for improving their sustainability and cost effectiveness.

Professor Richard Kitney (Department of Bioengineering) and Professor Paul Freemont (Division of Molecular Biosciences), co-directors of the Centre for Synthetic Biology and Innovation at Imperial, talked about what synthetic biology is, how it is done and the importance of innovations in this field for future generations.

Professor Richard Kitney, said: "This is such a new field of science and we want the public to get a basic understating of what synthetic biology is and how it can be applied to their everyday lives. From developing new types of therapies for patients to manufacturing more sustainable tyres for cars, the use of synthetic biology is wide-ranging."

Professor Paul Freemont added: "We want to share with the community just how amazing synthetic biology is and show them how this field of science has the potential to impact on all our lives in a positive way. Synthetic biology has a transformative potential and here at the Centre we are working with a range of companies to develop the technology and turn our vision into a reality."

ANY NEWS ITEMS?

If you have any items for the next newsletter please get in touch!

EMAIL
helen.findon@imperial.ac.uk

Rio Tinto Sports Innovation Challenge heads to Australia

by Dr Dominic Southgate

Students hard at work in the UTS labs

- The Rio Tinto Sports Innovation Challenge / GoGlobal project, a collaboration between the Royal College of Art, Imperial College London and the University of Technology Sydney, has gone fantastically well so far with 13 groups of IDE and UTS students busy working together on innovative sports projects. The concept phase has now finished and they are now into prototyping their devices. The ideas so far include an EEG monitoring and warning system to improve cycling safety in people with epilepsy, a new prosthetic for lower-limb amputees that can switch between land and water, and a transformable vehicle featuring arm and leg propulsion for low impact cardiovascular training. The end-of-module exhibition is taking place on the 27th March in Sydney but projects will also be on display at the Imperial Festival in May. Progress can also be seen on the Facebook page for the module - "Rio Tinto Sports Innovation: Sydney 2013".

Second year design projects as part of the Rio Tinto Sports Innovation Challenge

by Drs Dominic Southgate and Helen Findon

On 20 March the 2nd year Bioengineering undergraduates presented their prototypes from the Engineering Design Projects course to academic staff and visitors. The theme for the projects was again sports related as part of the Rio Tinto Sports Innovation Challenge. Specific briefs were identified in communication with athletes this year and the eight groups were then tasked with finding solutions to meet athletes' requirements.

The projects included a posture monitoring system for wheelchair athletes, a device to allow wheelchair basketball players to right themselves following a crash, a feedback system for visually impaired athletes during shotput, a safety device for officials in javelin, a torque limiting device for intraosseous prosthetics, an instrumented prosthetic component to measure running forces, adapted bicycle handlebars to allow standing-starts for upper-limb amputees and adapted rigging to allow upper-limb amputees to compete in sculling.

All of the groups received much praise from the external visitors, the best overall group will be judged in the coming weeks and the winners will receive a prize at the departmental research day at the end of June.

More photos from the event can be seen on the Department's Facebook page, they're worth a look – this album achieved the Department's highest ever like, comment and share rate reaching 2000 people!

One team of second years designed and built a device to allow users to right themselves following a crash in wheelchair basketball

Staff promotions

The Department is delighted to announce two academic promotions.

Simon Schultz has been promoted to Reader. This will take effect on the 01 August 2013. Many congratulations to Dr Schultz on this well-deserved recognition of his burgeoning international status in neurotechnology.

Etienne Burdet has been promoted to Professor. This promotion will also take effect in August and has been made in recognition of Professor Burdet's leading status in his academic fields of endeavour in research and education.

Many congratulations to Dr Schultz (left) and Professor Burdet (right)

Footballing heroes

by Michele Tonutti, second year undergraduate

On 10 March, 10 of our brave Biomedical Engineering students proudly represented the Department in the yearly CGCU departmental football tournament. Pulling off some extremely fashionable pink Bioengineering Department shirts (and showing once again that our sense of style is clearly superior to all the other engineers), our courageous players ignored the horrible conditions of the Hyde Park pitches and started a very efficient warm-up amid the laughter of the other teams for our colorful kit. The enthusiasm was very high — the skills and the physical shape not so much.

After an easy win against EEE (7-3), helped by their lack of players, we went on to face the first big obstacle: the fearsome Civil Engineers. Playing in their shiny reflective jackets, they started the game overflowing with confidence. Their confidence was misplaced however, and crashed hopelessly against our brilliant defense, more solid than any of the buildings they will ever build. And when, on a majestically constructed counter attack, we scored what would be the goal of the final (1-0 FT), their hopes collapsed faster than the Tacoma Bridge. Their cheeky attempts to claim non-existent goals and corners were of no use.

The following game was against Aero Eng. The two wins had galvanized us, and we went back onto the muddy pitch thinking we could conquer the whole world.

Unfortunately, despite them playing with one less player than us, we couldn't go further than 0-0. In the meantime, news came that Mech Eng, one of the major opponents for the title, had dropped out, clearly scared by our unstoppable successes. This granted us with an automatic 3-0 win. At that point, there was only one team between us and glory: Chem Eng, the favourite for the title. Despite their superiority on the pitch, the Bioengineers fought tooth and nail for a point, but the match ended 0-0. Chem Eng then went on to beat Civil Eng by 1-0, and despite the same number of points as us, finished first due to goal difference. In second place, unbeaten and with the same number of points as the first team we're proud as punch!

The mighty and almost victorious (pink) bioengineers!

NEWS IN BRIEF

Welcome to the Department

This month we welcome **Miss Marta Garcia Bellmunt** (Laboratory Technician), **Miss Shanas Choudhury** (Laboratory Technician) and **Mr Harry Lamble**, IBME Research Development Director.

We also welcome **Dr Kate Hobson** back from maternity leave and wish **Mrs Paula Smith** a fond farewell.

Outreach events

Many thanks to all those who participated in school outreach activities this month.

Dr Warren Macdonald attended a 'Meet the Engineers' event at Thomas Hardye school in Dorest (pictured below with his fellow participants and an Aston Martin!), **Drs. Angela Kedgley** and **Jennifer Siggers** took part in 'Careers Speed Dating' at Waldegrave School for Girls in Twickenham and **Drs. Rob Learney** and **Helen Findon** attended St Paul's School careers day in Barnes.

What does it take to be a Bioengineer?

Published this month in IEEE's 'The Institute', an article on the skills and qualifications required to become a biomedical engineer. Take a look.

Conference news

Professor Jimmy Moore has been invited to speak at the 11th International Symposium in Computer Methods in Biomechanics and Biomedical Engineering. This conference will take place in Salt Lake City, Utah, USA this April.

Viva success

Dr Mehdiye Sradarlou successfully completed her PhD viva last month with very minor corrections (supervisor **Professor Peter Weinberg**). Congratulations!

Bake off!

A huge thank you to staff and PhD students who baked and scoffed so generously for Comic Relief. We raised £152.68!

The day I met rock royalty

by Aislinn Hayes, third year undergraduate

I'm not being dramatic, but I think my life probably peaked sometime around 4pm last Tuesday afternoon. Am I too young to say that? Maybe, but to be honest, shaking hands with rock legends Brian May and Roger Taylor is most likely the coolest thing that will happen to me in my life.

So why were one half of one of the most influential rock bands in history at our humble Imperial College Union? Well, PRS for Music is the company that provides licences to all public establishments to play copyrighted music, and then distributes the royalties to the songwriters, publishers, and composers of this music. For example, IC Radio buys a licence from PRS every year for the music that we play. Anyway, since 2009 PRS has been awarding UK superbands with Heritage Awards to commemorate the location of their first performance. Turns out Queen's first London gig was in our very own Union Concert Hall! The plaque is going to have a brief stint at Metric before it's placed permanently on Prince Consort Road for all the world to see, have a looksie below right.

The unveiling was attended by Queen guitarist Dr Brian May, who holds an undergraduate degree in mathematics and physics from Imperial and completed his PhD in astrophysics in 2007, and drummer Roger Taylor, who met May through an advert for a drummer on a noticeboard in the Union. Needless to say, this caused great excitement throughout the college, and when IC Radio received an invitation to attend the press event, the committee got the closest it has ever gotten to complete barbarity. We had an application and vote based process to decide who would attend, and luckily for me and my blog, myself and the next president-elect of IC Radio, George Butcher, were chosen to attend. Enter my first ever press pass!

Some very elegant speeches were made by Union president Paul Beaumont, the chair for PRS Guy Fletcher OBE, and of course, Brian and Roger themselves. When the floor was opened up for Q&A, George stuck his hand straight up and I threw the IC Radio sign up in the air, and we made ourselves look so ridiculously eager that they really had no choice but to call on us. Check out my radio show to hear the full audio of George's hilariously brave invitation to Queen to pop down for a live session at IC Radio, and also check out the sound bite that we recorded of Brian May endorsing IC Radio!

We wandered around the venue when we had exhausted our time with Brian May and Roger Taylor, and actually met some incredibly interesting people along the way. Audio editing is still ongoing, but we interviewed Queen's Universal Music Group representative, some hard-core fans who've never missed a gig or tour and subsequently get invites to all these special events, PRS chair Guy Fletcher OBE, and even Imperial College's Press and Communications officer Lucy Handford who sent us the invitation in the first place. As if that wasn't enough, we cemented our place in IC Radio legend by getting the official IC Radio sign autographed by May, and an original vinyl signed by both May and Taylor.

This will be my final year as IC Radio president, next year I'm taking the back seat and going for supporting actress in Assistant Station Manager. We even had our AGM on the evening after this event where George was elected for next year, so it was an amazing experience for me to "end" on and for George to start out on. But never fear! My final year in bioengineering (assuming I can squeeze my way past the rest of this year of course) might have to take priority over my radio aspirations for now, but I will forever treasure this image of us rockin' with the Croc in our grown-up clothes at our official press event.

Of course, I wasn't the only one there. Read George's excellent account of the day here! And of course, the old reliable student newspaper Felix covered it too! But if you still don't believe me... Check out Dr Brian May's own blog post! Long live the Croc indeed.

Plaque photograph and main newsletter image kindly provided by Slobodan Radosavljevic.

Read more from Aislinn on her blog.

Events

Departmental Seminars

All seminars will be on Thursday 13:00-14:00 in room RSM 3.03 unless otherwise stated. A full list of seminars can be found on the events page.

For further details please contact Chiu Fan Lee. If you know of someone who would like to be on the email distribution list for these seminars please guide them to sign up list.

11 April 2013
Oshiorenoya Agabi, Imperial College London. Third year PhD talk. Title TBC.

18 April 2013
Vee San Cheong and James Field, Imperial College London. Third year PhD talks. Title TBC.

25 April 2013
Ali Neishbouri, Imperial College London. Third year PhD talk. Title TBC.

02 May 2013
Professor Nancy Allbritton, University of North Carolina. Title to be confirmed.

Strictly science

Please try and attend the forthcoming *free* interactive exhibition, **Strictly Science:** *keeping one step ahead,* which celebrates 100 years of the Medical Research Council with a series of peopled laboratory-inspired installations. The event brochure can be downloaded here.

05-14 April 2013, 10.00-18.00 daily

Exhibition Road Foyer, Imperial College London.

Come and find out how a century of medical research has changed all of our lives. Imagine what will happen in the next 100 years.

Play with video game technology used by TODAY lab scientists to study the brain and treat neurodegenerative disease. This lab is based on the research of our very own **Dr Aldo Faisal**. Watch live demonstrations in the YESTERDAY lab of century-old experiments on war-wounds, the nervous system and nutrition. Experience a 3D sound sculpture exploring our hopes and fears for the future in the TOMORROW lab and share your views.

Book free tickets for **Strictly Science** *lates* at
www.strictlyscience.mrc.ac.uk
www.facebook.com/strictlyscience
www.youtube.com/strictlyscience
@Strictly_Sci

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Department of Bioengineering
Imperial College London
SW7 2AZ
+44(0)20 7594 5179

www.imperial.ac.uk/bioengineering
@imperialbioeng
facebook/imperialbioeng