THE LEADING DEPARTMENT OF BIOENGINEERING IN THE UK

BIOENGINEERING NEWSLETTER AUGUST 2013

Volume 7 Issue 8

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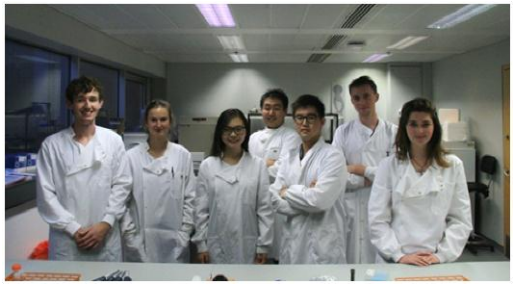

Success for new recruits

by Mengxing Tang

Next month the Department will be welcoming a new cohort of bioengineers to the course and what a cohort they are. A-level students across England, Wales and Northern Ireland received their results on Thursday 15 August after months of anticipation. Those celebrating being accepted onto our Biomedical Engineering course truly are the crème de la crème.

94% of students got A* or A in Science Technology Engineering Maths (STEM) subjects, with 75% of A*s in Maths, Further Maths or Physics. All of the students accepted for the class of 2013 got at least an A in Maths. The average STEM grades this year are at A*A*A (comparing to the college-wide entrance requirement of AAA and above), with the highest entrant grades for the course 5 A*s in Maths, Further Maths, Physics, Chemistry and Biology. The A-level students will also be joined by an array of equally high calibre international students.

It is great to see Biomedical Engineering attracting such high calibre students and we look forward to working closely with these students as they develop their bioengineering knowledge and skills over the next few years at Imperial College London.

We are also keen to welcome back our returning students especially those representing Imperial College London in the iGEM (International Genetically Engineered Machine) competition. We will be following their progress in the competition in a dedicated column over the next few months. As you will see from this edition of the newsletter our current students and staff are setting quite the example for the new recruits. Our undergraduates, postgraduates and researchers are excelling giving poster presentations and talks all around the world.

Finally, welcome to Dr Tobias Reichenbach and Dr Claudia Clopath, who have joined the academic staff this month.

Engineering Paralympic solutions

by Henrik Hagemann

After 2 weeks of brainstorming, designing and manufacturing for the Rio Tinto Sports Innovation Challenge, the three of us arrived at Herne Hill Velodrome, a historical track cycling venue from 1891. This would be the testing site for our custom-made bike designed to allow above elbow amputees to transition from a more powerful 'standing start' to the speedier 'aero position' of high-speed track cycling, rather than being constantly fixed to the aero position. A nylon pivoting lever that rotates around a hinge attached to the handlebar had been manufactured by our team for this purpose, thereby enabling our cyclist to test the transition and sturdiness of our design. And our tester? None other than triple Paralympic silver medallist Jon-Allan Butterworth.

Butterworth arrived at midday to greet an eager press and to try out the bike we had prepared for the day. While he got changed, we bolted his prosthetic socket to our device and, with the help of our supervisor Dr Southgate, engineered and extra locking pin that better matched his personal aero position. With the device now ready to go, he went for the first of many laps that would prove invaluable in the feedback he provided us with. After interviews with Sky News, ITV News, Cycling Weekly and a journalist following Butterworth for a documentary, we got to hear his opinion on the bike. He described with contagious enthusiasm the time-cutting prospect of using our handlebar, and liked the idea enough to suggest ways of improvements for a prospective prototype based on the same design.

Having only worked on this design for 2 weeks, it was tremendously rewarding to get his approval, and impossible to stop his intense passion from motivating us to pursue an even better handlebar within the subsequent 8 weeks of our project. This new prototype will be better fitted for his requirements and will allow multiple positions to be tested to optimise the aerodynamics of his position. With the aim in mind of having a carbon-cast prototype ready for him by the World Championships in April 2014, this will hopefully prove to be the first of many encounters with a remarkably down-to-earth Paralympic superstar.

Team consists of Gabrielle Whitworth-Smith, Jed Farquharson and Henrik Hagemann (Second year Bioengineers).

Associateship of the City and Guilds of London Institute medal for Daniel

by Jenna Stevens-Smith

Congratulations to Daniel Lopez Martinez who has been awarded the ACGI medal for excellence.

Daniel has been awarded a MEng Biomedical Engineering degree of Imperial College London with First Class Honours and the Associateship of the City and Guilds of London Institute (ACGI).

In addition to his academic achievements Daniel has demonstrated initiative in finding and benefiting from internships at Cambridge (twice), Oxford, Harvard and MIT. The broadening and deepening of his Bioengineering knowledge has led to Daniel contributing original work to two co-authored journal papers as well as poster and paper presentations at international conferences.

He has been awarded a scholarship to read for an MPhil in Bioscience Enterprise at University of Cambridge this autumn. Then he will take up a PhD studentship in Medical Engineering & Medical Physics (jointly run by MIT and Harvard University) in 2014. Daniel is clearly committed to a Bioengineering career and has great potential to become a leading light in the field of Bioengineering.

Dr Anil Bharath (his final year project supervisor) succinctly distils the thoughts of all the academic staff who have known Daniel by describing him as "pretty outstanding".

IN THE MEDIA

Synthetic Biology podcasts

Researchers in the Centre for Synthetic Biology and Innovation (CSynBI) have been busy over the last couple of months with features on the Imperial College and Society for General Microbiology podcasts.

The Imperial podcast focused on the 6th International Synthetic Biology Meeting and featured Professor Richard Kitney, Professor Paul Freemont, Dr Guy-Bart Stan, Dr Tom Ellis, Ben Reeve, Holly Million and Dr Francesca Ceroni.

The Society for General Microbiology podcast featured Guy-Bart, Tom Ellis and Ollie Wright talking about biosafety and containment of engineered microbes. A topic they recently wrote a review on. The review and a workshop they ran on the same topic in March are now being used by the UN's Secretariat of the Convention on Biological Diversity to determine whether GM regulations should be changed.

FAST FACTS

80%

Mixed waste we send to recycling is recyclable.

320,000 tons

A year of potentially recyclable waste is sent to landfill in West London.

Got some news you want to share with the rest of the Department? Then get it in the next newsletter

JENNA STEVENS-SMITH
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Team members (shown left to right in attached photo): Iain Bower, Margarita Kopniczky, Sisi Fan, Wenqiang; Chi, (Matthew) Ho Wai Chin, James Strutt, Jemma Louise Pilcher.

Imperial students engineer microbes to make environmentally friendly plastics from non-recyclable waste

by iGEM team

A team of seven Imperial undergraduate students are competing in the prestigious international genetically engineered machines competition (iGEM), and are due to present their research at the European final in Lyon, France, in October. Historically Imperial has a strong track record in the competition and this year's team are expected to progress to the global finals held at MIT, USA in November.

The iGEM competition is designed to inspire a new generation of scientists to engage with 'synthetic biology', a rapidly growing scientific field, in which living organisms and systems are engineered to help address global challenges.

The students have been working since the beginning of July and have just ten weeks in total to design, build and test their system, which is designed to turn non-recyclable waste into biodegradable plastics. To achieve this, the students are engineering bacterial 'machines', which can degrade waste into components such as glucose and plastic monomers. These components can then be reassembled, using bacteria into environmentally friendly bio plastics.

One of the team's advisors, Dr Richard Kelwick explains, "Currently only 80% of the mixed waste we send for recycling is recyclable. That leaves 20%, which is destined for landfill or incineration. To put this into perspective, in West London alone this represents at least 320,000 tons a year. Plastic is a major component of this non-recyclable waste and due to its poor biodegradability, poses a significant risk to the environment."

Iain Bower, one of the iGEM team members, explained more about how the team's project developed.

"We spoke to a wide range of experts from industry, government, and NGOs to gain a deeper understanding of current recycling streams. From these discussions we realised that there was a need to tackle a class of mixed waste, called solid recovered fuel (SRF), which cannot be recycled using existing means, though we believe our project can help address. We also appreciate that recycling is a social issue that many people care about and so we wanted to listen to those views and hopefully show that synthetic biology can make a positive contribution in this area."

You can follow the Imperial 2013 iGEM team progress via twitter @imperialigem or on the team's official web page http://2013.igem.org/Team:Imperial_College

For more information on the iGEM competition check out their website

October 11-13 2013
iGEM Regional Jamborees: Europe
Lyon, France
November 1-4 2013
iGEM World Championship Jamboree
MIT, Cambridge, MA, USA

NEW FEATURES FOR NEW ACADEMIC YEAR

It is nearing the start of a new academic year and to mark this new beginning the newsletter is getting some new features. Features including Bioengineers abroad, Alumni: where are they now and Careers Corner.

Bioengineers abroad

First Bioengineer abroad- Head of Department, Professor Anthony Bull on holiday in Italy this summer.

Are you going abroad for a conference, field work or a well-earned holiday? If so why not enter our Bioengineers abroad competition and promote the Department of Bioengineering while you're at it.

The only rule being that you must be wearing a Department of Bioengineering t-shirt.

To submit a photo for the competition, please email Jenna Stevens-Smith.

Alumni: Where are they now?

Department of Bioengineering Alumni are all around the world forging successful careers in a variety of fields.

In this new feature we will learn more about where our alumni are now, what they have done since they left Imperial College London and any top tips they have for current students in the Department. If you're interested in being featured then get in contact with Jenna Stevens-Smith.

Careers Corner | Introducing your Careers Service Team

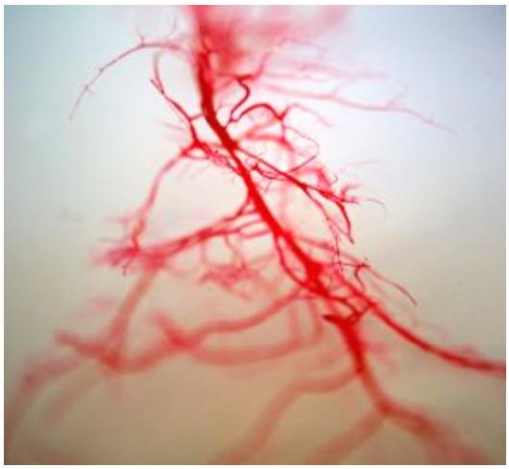
By Yasmina Mallam-Hassam

If you ever wondered what skills employers are looking for, how to write a killer CV or how to start looking for an internship to boost your work experience, you could seek advice from the Bioengineering Careers Team within the Imperial College Careers Service. Yasmina Mallam-Hassam, Careers Consultant and Amy Townsend, Placement and Internship Officer will be available to help with all your careers-related queries. We will be running timetabled sessions on Tuesdays or Thursdays from 17.00-18.00 and one to one drop-ins within the department every Tuesday lunchtime from 12.30-13.30, which you can book via Jobslive on the Careers Service homepage http://www3.imperial.ac.uk/careers.

The Careers Service will be running lots of events on campus which will enable you to find out what employers are looking for and also to build your transferable skills, for example the Engineering Fair on 24th October and the Employer-Led Skills Workshops every Wednesday afternoon from 13.30. It's never too early to prepare for your career and we look forward to helping you achieve success.

Robert Ferguson, Industry Liaison Manager will also be inviting representatives from Biomedical Engineering companies into the Department as part of the Bioengineering career talk programme. Following the success of last terms industry trips, Robert will also be organizing more of these.
Further details including an upcoming events calendar for all the careers and employability skill events will be in the next newsletter but if you would like to express an interest in any of the opportunities overviewed please email Robert Ferguson.

ACHIEVEMENTS



Double poster success for Anusha

PhD student Anusha Seneviratne presented her poster titled "Macrophage Heterogeneity in Developing Vulnerable Atherosclerotic Plaques Modulated by Shear Stress" at the IUPS 2013 (International Union of Physiological Sciences) and the International Early-Career Symposium (IECS 2013) conferences in Birmingham. Anusha was awarded a poster prize by the European Vascular Biology Organisation (EVBO) at IUPS and won the award for the best poster presentation at the IECS conference.

Tempest takes top prize

Tempest van Schaik a PhD student in the Department of Bioengineering has won the Goodenough Photograph 2012 Award with her photo of the Queen's tower. The theme of the annual photography competition was "Streets of London" and Tempest's photograph features a view of Imperial's Queen's Tower from her cycle. For more information about the competition, click here.

Biomechanics thesis prize for Angelo

Angelo Karunaratne, a research associate in the Department was invited to give a keynote speech at the European Society of Biomechanics (ESB) Congress in Greece on 28th August after being awarded the prize for Best Doctoral Thesis in Biomechanics. Angelo's thesis was on the "Analysis of alterations in matrix quality at nanoscale in metabolic bone diseases using synchrotron X-ray diffraction". This is a new award with which the ESB recognizes the development of an outstanding doctoral final thesis that has contributed to the advancement of the theory and/or applications of Biomechanics.

Details of the announcement of the award can be found here.

IEEE world tour for Alireza

Congratulations to undergraduate Alireza Tahmasebzadeh who presented at the IEEE EMBC (Institute of Electrical and Electronics Engineers Engineering in Medicine and Biology Society) in Osaka, Japan and has been invited to present his new project at IEEE International Conference in Neural Engineering 2013 which will be held in San Diego from 5-8 November 2013. This is an impressive achievement for a student going into their second year.

IET Grant success for Henrik

Congratulations to Henrik Hagemann who has been awarded an IET grant for undergraduates. Henrik will be presented with his award at the awards ceremony on the 20th November.

The Institution of Engineering and Technology offer up to 10 grants a year to students studying IET accredited courses. For more information about the grant scheme and other schemes offered by IET click here.

UPCOMING EVENTS

03 Sep MSc presentation day

05 Sep TedxSalon: Michelle Rogers

11 Sep CBIS Lecture Series: Professor David Sharp 'Traumatic Brain Injury and Cognitive Function'

12 Sep Third year talk by Itir Koymen

12 Sep Imperial Fringe: What makes me me?

21 Sep MSc Alumni Reunion

23 Sep Departmental Seminar: Dr Kimiko Yamamoto (University of Tokyo)

23 Sep TedxAlbertopolis

26 Sep Third year talk by Anastasia Sylaidi and Alexandra Berditchevskaia

28 Sep Autumn Term begins

07 Oct Rio Tinto Sports Innovation symposium

08 Oct Departmental Seminar: Professor Adam Mahdi (North Carolina State University)

09 Oct Departmental Open Day

11 Oct iGEM Regional Jamborees: Europe, Lyon, France

24 Oct Departmental Seminar: Dr Tobias Reichenbach (Dept of Bioengineering Imperial College London)

31 Oct Imperial Fringe: Your number's up

01 Nov iGEM World Championship Jamboree, MIT, Cambridge, USA

07 Nov Departmental Seminar: Professor Jonathan Butcher (Cornell University)

14 Nov Departmental Seminar: Professor Jane Mellor (University of Oxford)

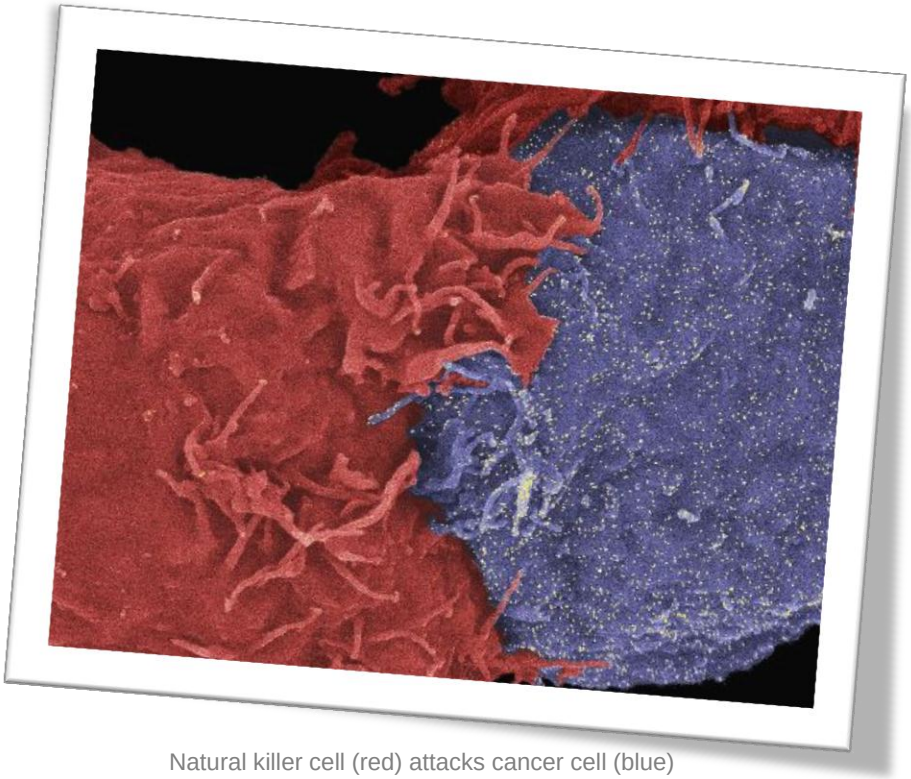
21 Nov Departmental Seminar: Dr Spyros Masouros (Department of Bioengineering, Imperial College London)

Cancer engineering

Cancer has mainly been the research topic of biological scientists and clinicians in the past but this month the Department of Bioengineering was successful in receiving funding to establish the Network of Excellence in Cancer Engineering. The bid was led by Professor Peter Weinberg, Professor in Cardiovascular Mechanics and Director of Research in the Department of Bioengineering with the aim of taking an engineering approach to cancer research.

The Network are currently recruiting for research students for four new interdisciplinary, collaborative research projects bringing together physical scientists/ engineers with biomedical scientists/ clinicians, across the faculties. In total the network is currently formed of six projects.

Further information about the network including a network membership list can be found on their webpage.



Natural killer cell (red) attacks cancer cell (blue)

PhD studentship available in Cellular Biomechanics of Blast Injury

If you are interested in:

- Studying at the interface of blast biomechanics, biology and therapeutics?
- Discovering the cellular mechanisms of blast injury?
- Working in world-leading laboratories with experts in the field
- Learning cellular and molecular technologies for transferable skills

Then contact Dr Darryl Overby about an exciting PhD opportunity with him and Professor Sara Rankin starting October 2013.

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