



Imperial Bioengineer

May 2016

NEW UNDERGRADUATE PROGRAMME!

The Department first began teaching the **UG Biomedical Engineering** programme in 2002.



Over the last decade the Department has continued to evolve and develop the programme based on research innovations and feedback from students and advisory boards. Developments have included the addition of specialist pathways in the third and fourth years and accreditation by four professional engineering institutions. The excellence of the programme was recognised this year when the MEng in Biomedical Engineering topped the 2017 Guardian University League Table for General Engineering.

However, the discipline of bioengineering has continued to evolve at a fast pace and the Department decided there was a need for another programme, one built upon strong foundations in chemistry and maths, rather than the strong maths and physics background required for biomedical engineering. Development of the new programme has been led by Dr Sylvain Ladame and Professor Martyn Boutelle.

The new programme degree called Molecular Bioengineering will be an additional undergraduate programme to the current Biomedical Engineering degree from 2017. The two bioengineering programmes take contrasting but complementary approaches to bioengineering. Molecular Bioengineering develops a bottom up understanding of the links between molecules, cells, tissues, organs, limbs generating function, health and disease within a bioengineering context whereas our Biomedical Engineering programme takes a top down approach, meaning graduates from each bioengineering programme will be uniquely skilled.

Alongside a breadth of core engineering and bioengineering knowledge, graduates of the Molecular Bioengineering programme will have a specialist understanding of biochemical, physiological and biological processes coupled with excellent advanced practical laboratory skills in chemical biology, molecular biology, synthetic biology, analytical sciences, microfluidics and device engineering. In the first and second years of the Molecular Bioengineering programme over 60% of modules will include lab-based learning and teaching activities.

The entry requirements reflect the importance of a strong interest and foundation in chemistry as well as maths. For A level mathematics and chemistry, and one other A level subject (preferably biology, further maths, or physics) are required at least at grades A**A.



WELCOME TO THE DEPARTMENT

Welcome to new starters

- **Kemi Aofolaju**
Departmental Secretary
- **Jason Chang**
Research Associate with Dr Darryl Overby
- **Giuseppe Zito**
Research Associate with Dr Aldo Faisal

This month sadly two colleagues are leaving, we wish them all the best in their new roles:

- **Samantha Martin**
- **Dr Emma Bailey**

GRANT SUCCESS

Dr Mengxing Tang awarded a CRUK Multi-Disciplinary Award grant to work with co-Investigators from FoM and FoNs to develop cancer perfusion and molecular imaging techniques using ultrafast ultrasound and microbubbles (£490,000)

Professor Etienne Burdet awarded EPSRC grant for MOTION - morphological computation of perception and action (£292,798)

PUBLICATION SPOTLIGHT

Be sure to check out the Department's recent publications:

Thomas Zeller, Peter A. Gaines, Gary M. Ansel, and Colin G. Caro *Helical Centerline Stent Improves Patency-Two-Year Results From the Randomized Mimics Trial* Circulation: Cardiovascular Interventions. 2016; 9: e002930 doi:10.1161/CIRCINTERVENTIONS.115.002930

Gunnar Pruessner and Chiu Fan Lee (2016) *Comment on "Anomalous Discontinuity at the Percolation Critical Point of Active Gels."* Physical Review Letters 116(18):189801. doi:10.1103/PhysRevLett.116.189801.

Chiu Fan Lee and Gunnar Pruessner (2016) *Percolation mechanism drives actin gels to the critically connected state.* Physical Rev E 93(5):052414 doi:10.1103/PhysRevE.93.052414.

Benjamin K. Robinson, Ernesto Cortes, Alistair J. Rice, Muge Sarper, Armando del Río Hernández. *Quantitative analysis of 3D extracellular matrix remodelling by pancreatic stellate cells* <http://bio.biologists.org/content/early/2016/05/03/bio.017632>

Anna Stejskalová, Mehrdad T Kiani, and Benjamin D Almquist *Programmable biomaterials for dynamic and responsive drug delivery* Exp Biol Med doi:10.1177/1535370216649445

B620 HEALTH & SAFETY UPDATE



Update regarding incident in B620. Explosion of a bromination experiment (to perform synthesis of dibromomaleimide) that caused the hood sash to also shatter. Within this chemistry lab all researchers value the safety precautions detailed for the lab and within the risk assessments. Due to this all were wearing flame retardant lab coats, safety spectacles, nitrile gloves and covered footwear. Good hood practice was also being followed and the sash of the hood was lowered at the time. Following the incident all incident procedures were followed well, evacuation and shutting down of the lab immediately, notifying the correct people and calling 4444. It is key to note the importance of good practice, good training and awareness, properly completed risk assessments, excellent experimental record keeping and the wearing of appropriate PPE. This is specifically the reason that no-one was seriously injured this time – things could have been a lot worse! It is to the credit of this lab that in the face of such an incident all good practice was observed.

CONGRATS TO ALL OUR POSTGRADUATES WHO GRADUATED ON 4 MAY 2016!

OUT AND ABOUT

Dr Hari Arora was invited to speak at the Explosive Blast Response of Naval Composite Materials and Structures Workshop at RMIT, Melbourne, Australia (6 April 2016). Funded by the Office of Naval Research (US). Dr Arora also met with researchers at NTU and A*STAR in Singapore who he is collaborating with on mitigating materials development.

Dr Reiko Tanaka gave a plenary lecture on "Systems dermatology for mechanistic understanding of skin barrier homeostasis" at Cosminov 2016, an international conference of cosmetology, in Orleans, France, in May.

Dr Hari Arora was invited to give a technical talk on translational research, defining how mechanical engineering practice is being applied across the field of bioengineering and in particular my research on blast lung injury at IMechE, London, UK on 18 May 2016.

Professor Jimmy Moore gave a lecture to Stanford Biodesign students in May.

STAFF & STUDENT SUCCESS

Julia Sun (Almquist group) has won the Best GTA award at the Student Academic Choice Awards (SACA)

Tony WK Cheung (Tang group) has just passed his PhD viva

Anna Sharrock (CBIS) was awarded the **Richard Wiseman Medal** at the Association of Trauma & Military Surgery (ATMS)

Anisha Malde (4th year MEng) was a finalist for the **Female undergraduate of the year** and was awarded an internship. As part of being a finalist Anisha was required to give more insight on how to get more women involved as well as become part of **Rolls-Royce Advertising videos**.

Professor Molly Stevens was awarded the **2016 Clemson Award** for Basic Research at the World Biomaterials Congress in Montreal, Canada this last Friday. The Award recognises her for having contributed to the basic knowledge and understanding of the interaction of materials with tissue.

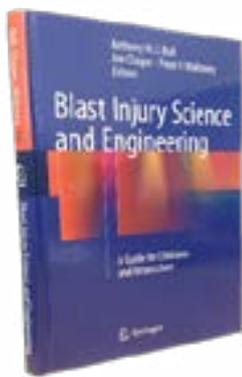
Dr Stefaan Verbruggen (Nowlan group) awarded the prize for Best Poster at the Insigneo Clinical Translation Showcase 2016 in Sheffield on Thursday 5th May. The poster was titled: "Fetal Movements as Biomarkers for Fetal Health".

Paul Rinne and **Michael Mace** (Burdet Group) were runners-up at the oneStart finals with their stroke rehabilitation innovation gripAble.

ALUMNI CORNER

May was a successful month for student start-up CustoMem with co-founder Gabi Santosa winning 2016 Althea Imperial, a women's entrepreneurship programme for female Imperial students (3 May) and the following day **Henrik Hagemann** (MEng 2015) CustoMem co-founder and CEO was awarded a Royal Academy of Engineering Enterprise Fellowship.

Blast Injury Science & Engineering. A guide for clinicians and researchers.



Academics and researchers from the Centre for Blast Injury Studies, together with a number of external collaborators have compiled a textbook detailing the science and engineering of blast injury science. Aimed to help the spectrum of researchers from all backgrounds who seek to conduct science and engineering based research on blast injuries, the contents of the book are a consequence of the team's experience in working in an interdisciplinary environment. As such, there is something for everyone. The text is divided into 4 sections. Section A provides a background in blast physics, biomechanics and the behaviour of materials, giving the reader a solid introduction to the underpinning physics of blast transmission

through and within materials. Section B characterises blast injuries by the process of explosion and some of the weapons that produce such injuries. Using the London 7/7 suicide bombings as an example, Section C provides information on the principles of forensic investigation and the types of physical and computational models used to improve the understanding of blast and blast mitigation. The effects of blast on the human is further developed in the final Section (D).

Published by Springer, the textbook is available for purchase via all major retailers, the proceeds of which will go towards the Royal British Legion.

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UPCOMING EVENTS

Inaugural Lecture

09 June 2016

Manoeuvrability on the fly
Professor Holger Krapp

Departmental Seminars

Thursdays 12.00-13.00

16 June 2016 12:00-13:00 RSM2.28

Multiscale and Multiphysics Modeling of Body Armors and Biomechanics

Professor Young Kwon, Department of Mechanical and Aerospace Engineering, California

20 June 2016 12:00 - 13:00 RSM2.28

Bringing EEG into Real-Life Applications

Professor Maarten De Vos, Associate Professor in Engineering Science, University of Oxford.

Imperial Events

1 June 2016

CBIS seminar

Amputation Seminar and Networking Event

http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/engineering/bioengineering/blastinjurystudies/eventsummary/event_18-5-2016-17-15-36

7-8 June 2016

Underbody Blast Symposium

The meeting will bring together experts from biomechanics and clinical research, national authorities, NATO working groups, and test houses.

http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/engineering/bioengineering/blastinjurystudies/eventsummary/event_25-5-2016-17-52-7

15 June 2016

Neurotechnology seminar

Professor Peter Dayan, Gatsby Computational Neuroscience Unit, UCL and Dr Mark Humphries, University of Manchester

http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/engineering/centreforneurotechnology/eventsummary/event_6-5-2016-11-23-6

15 June 2016 17:30-18:30

2016 Bioengineering Annual Lecture

Professor James Collins, MIT

Imperial College London, South Kensington campus
http://www.imperial.ac.uk/bioengineering/about/bioengineering_lecture/

20 July 2016

Annual Neurotechnology Research Symposium

Plenary talks from James Fawcett, University of Cambridge and Wouter Serdjin, Delft University of Technology

http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/engineering/centreforneurotechnology/eventsummary/event_5-1-2016-14-45-18

Conferences

4-7 July 2016

Eurohaptics 2016

Professor Etienne Burdet, Dr Ildar Farkhatdinov and Dr Franck Gonzalez are co-organising. Website: www.eurohaptics2016.org Imperial College London, South Kensington campus

14-15 July 2016

Precision Medicines Conference 2016

South Kensington, London

Including talks from Sylvain Ladame, Armando del Rio Hernandez and Molly Stevens from the Department

5-6 September 2016

MEIbioeng16 (abstract deadline 6 May)

Institute of Biomedical Engineering, University of Oxford
 Website: <http://meibioeng.org/>

7-9 September 2016

Young Researchers' Futures Meeting 2016

Medical Imaging and Interventions: engineering a better look at cancer
 Imperial College London, South Kensington campus

Website: <http://www.yrfm.uk/>

12-14 September 2016

Medical Physics and Engineering Conference 2016 (MPEC)

Science for patient benefit

Manchester
 Website: www.ipem.ac.uk/ConferencesEvents/MPEC.aspx

5-8 October 2016

2016 BMES Annual Meeting

Innovation at the Interface

Minneapolis Convention Center/ Minneapolis, Minnesota, USA

Website: bmes.org/annualmeeting

CONTACT

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