



NEW ACADEMICS ON THE BLOCK

The Department of Bioengineering is delighted to welcome new members of staff to our academic team. Our talented new crop of lecturers and research fellows will ensure that our department remains at the forefront of research and teaching. We look forward to having them on board with us and would like to take this moment to introduce them and their work to readers of the Imperial Bioengineer.

LECTURERS



Dr Sam Au
Lecturer

Dr Au did a postdoctoral fellowship at Harvard Medical School with Mehmet Toner where he developed microfluidic models of capillaries to explore the ability of circulating tumour cell aggregates to transit through the circulation. Using biophysical, xenograft and computational models, he demonstrated that these multicellular clusters can unfold into single file chains which permitted them to transit through constrictions as small as five microns.

Sam is particularly excited about future collaborations and scientific advances that will emerge in the years ahead. A major theme of his interests are how physical forces interact with cells or subcellular. Sam is delighted to join the Department and is looking forward to getting to know everyone.



Dr Adam Celiz:
Lecturer

Dr Celiz gained his bachelor's degree in Pharmaceutical and Chemical Sciences at the University of Brighton and a PhD in Chemistry at University of Cambridge in the Melville Laboratory for Polymer Synthesis. Following this, he was awarded a Marie Curie International Outgoing Fellowship to perform postdoctoral research at the University of Nottingham and the Wyss Institute for Biologically Inspired Engineering at Harvard University.

During this fellowship, Adam designed biomaterials that interact with tissues and stem cells to repair or regenerate tissues, specifically, "tough" surgical tissue adhesives and regenerative dental fillings. His research has been published in journals such as Science, Nature Materials and Advanced Materials. Adam joined the Department of Bioengineering at Imperial College London in August 2017 as a Lecturer where he will be developing biomaterials for tissue repair and regeneration.



Dr Chris Rowlands
Lecturer

Dr Rowlands studied Chemistry here at Imperial College, before leaving to complete a PhD in glass physics with Stephen Elliott at Cambridge University.

Chris' interest in Raman microscopy lead him to Ioan Nottingher's lab at the University of Nottingham, to study the use of Raman in diagnosing and treating cancer, before leaving to take up a Wellcome Trust MIT Postdoctoral Research Fellowship in Peter So's lab at MIT. At MIT, he developed new tools for multiphoton photodynamic therapy for cancer treatment, super-resolution mapping of the mouse brain for connectomic applications, activity mapping of large numbers of synapses in a mouse brain, high-throughput multiphoton intravital imaging and blood-flow monitoring.

After returning to Cambridge to develop high-throughput super-resolution localization microscopy techniques, Chris joined us here.

Chris's interests lie primarily in optical engineering and neurophotonics, but with a broad background he is keen to collaborate widely and take full advantage of the academic freedom that a lectureship provides.

RESEARCH FELLOWS



Dr Rodrigo Ledesma-Amaro
ICRF Research Fellow

Dr Ledesma-Amaro has just joined the Department of Bioengineering as an Imperial College Research Fellow. Before this, he studied Biotechnology and Chemical Engineering in Spain where he also completed a PhD in Systems Metabolic Engineering. During that, he has been a visiting researcher in Japan, Sweden, France, and Belgium. After his PhD, he moved to Paris (INRA) as a Marie Curie Agreenskills Fellow to work on engineering microorganisms for the production of fuels and chemicals. His works produced numerous articles and patents.

Now, Rodrigo will be developing his research on the interface of synthetic biology and metabolic engineering with applications in biotechnology and biomedicine. He is specially interested in metabolism, microbiome research, strain engineering and bioproduction.



Dr Joseph Sherwood
RAEng Research Fellow

Dr Sherwood studied Mechanical Engineering at Kings College London before completing a PhD in Biofluid Dynamics with Dr Stavroula Balabani at University College London. In Autumn 2012, Joseph started as a post-doctoral researcher with Dr Darryl Overby here at the Department of Bioengineering, working on a project looking at endothelial cells under controlled mechanical forces in microchannels. During this project, Joseph became involved with investigating the flow of aqueous humour in the front part of the eye and used his experimental fluid dynamics experience to develop a system to measure aqueous humour flow called *iPerfusion*. *iPerfusion* is now being used by over thirty researchers in seven international research institutions.

Now, Joseph will be focus his research on establishing the role of blood flow in microvascular diseases in order to open up avenues for potential treatments.

CONTACT

Send news for the next issue to:

Kemi Aofolaju

Communications and Events Officer

Imperial Bioengineer

Aug-Sept 2017

WELCOME TO THE DEPARTMENT

Welcome to new starters:

- **Estefania Nunez Bajo**, RA with Dr Firat Guder
- **Mahendran Subramanian**, RA with Dr Aldo Faisal
- **Ester Reina Torres**, RA with Dr Darryl Overby
- **Bailey Marques**, Student Administrator
- **Ollie Waite**, Student Administrator
- **Saima Ahmed**, RA with Dr Niamh Nowlan
- **Ivan Vujaklija**, RA with Professor Dario Farina
- **Dr Jonathan Mark Kendrew**, Honorary Research Fellow

We will sadly be saying goodbye to a number of colleagues who are leaving. We wish them the best in their new roles:

- Dr Yanan Li
- Dr Emma Burke
- Dr Margherita Castronovo

UPCOMING EVENTS

The Invention Rooms Open Day

28 Oct 2017 Imperial College London
Celebrate the opening of The Invention Rooms at White City with a free community open day of free maker activities for people of all ages

BSSM Postgraduate Experimental Mechanics (PGEM) Conference

16-17 Nov 2017 Imperial College London
The BSSM PGEM Conference aims to bring together PhD/MPhil postgraduate students and early career researchers involved in the field of Engineering measurement and experimental techniques in stress, strain and vibration analysis. The conference provides an excellent opportunity to share and discuss their current research in a low pressure and relatively informal environment, learn about research projects at other institutions, network amongst like-minded people and make contacts for the future. For more information, please contact [Dr Hari Arora](#).

The Centre for Blast Injury Studies 2017 Annual Networking Event

16 Nov 2017 Imperial College London
CBIS' 2017 Networking and Research Update Event will cover topics from point-of-injury through to long-term outcomes of blast injury. For more information, please contact [Melanie Albricht](#).

Professor Manos Drakakis' Inaugural Lecture: "Non-linear Low-power Microelectronics For and From Biology: A Log Story"

6 Dec 2017 Imperial College London
The lecture is free to attend and open to all, but registration is required in advance

STAFF & STUDENT SUCCESS

Congratulations are due to:

- PhD student Sarah Johnson who won a prize for her poster at the NAVBO Outstanding Poster awards
- Professor James Moore Jr who represented Great Britain at the World Championships of Beach Ultimate Frisbee in June 2017
- Dr Rylie Green who won the RSC Emerging Technologies competition in the Materials and Enabling Technologies category. This includes a £10,000 prize and support in developing a start-up based on our conductive polymer technologies for bionics
- Dr Jenna Stevens-Smith who was highly commended for the President's Award for Leadership in Societal Engagement for 2017
- Dr Christina Warboys who was elected to sit on the committee of the British Society for Cardiovascular Research for a three year term from January 2018
- Dr Stefaan Verbruggen who was awarded 1st prize Oral Presentation at the 2017 Joint Meeting of the Anatomical Society and the American Association of Anatomists.
- Dr Ben Almquist who passed his academic probation on the 19th July 2017
- Dr Hari Arora and Dr Ben Almquist who were awarded Fellow status in the Higher Education Academy
- Dr Yu Liu who was awarded Associate Fellow of the Higher Education Academy
- Darshan Shah who passed his viva with his thesis entitled 'Design and implementation of a physiologic wrist simulator with applications to surgical reconstructions'.
- Mara Pop and Alistair Rice who were joint winners of the 2017 PhD Symposium prize
- Jaime Aguilera Garcia who won the Student Award for Outstanding Achievement 2017. These awards are to recognise and commend outstanding achievement beyond the academic subject area.
- Professor Molly Stevens who was awarded the Harrison Medal by the Royal Pharmaceutical Society for her outstanding contribution to pharmaceutical science.
- Dr Amanda Foust on the birth of her son, John.
- Dr Tom Ellis on the birth of his daughter, Pim.

OUT AND ABOUT

Professor James Moore Jr presented an invited lecture at the 5th Annual BME-IDEA EU conference

Dr Ben Almquist gave a talk titled "Rewiring wounds to heal" at the World Economic Forum Annual Meeting of New Champions in Dalian, China, on 28 June.

David Nesbitt and **Jean David Wurtz** from the Lee group spoke at the CDT Fluids Student Symposium 2017 on July 12th. The titles of their talks were "Stokes flow in active fluids" and "Chemically-controlled liquid-liquid phase separation of the cell cytoplasm" respectively. David also gave the same talk at the UK Fluids Conference in Leeds in September whilst Jean David gave his talk again at the 19th International Union of Pure and Applied Biophysics (IUPAB) and 11th European Biophysical Societies' Association (EBSA) Congress in Edinburgh in July

As Fellow of the Royal Academy of Engineering, in July 2017 **Professor Molly Stevens** spoke at the Global Challenges Summit 2017 in Washington DC, USA hosted by the UK, US and Chinese Academies of Engineering

Professor Molly Stevens delivered a Plenary lecture as Centenary Congress Speaker at the Royal Australian Chemical Institute (RACI) Centenary Congress.

PUBLICATIONS

Be sure to check out the Department's recent publications, some of which are included here:

Dariusz Lachowski, Ernesto Cortes, Daniel Pink, Anthony Chronopoulos, SA Karim, JP Morton, and Armando del Rio Hernández, *Substrate rigidity controls activation and durotaxis in pancreatic stellate cells*, Scientific Reports (2017), [doi:10.1038/s41598-017-02689-x](https://doi.org/10.1038/s41598-017-02689-x)

AJ Rice, E Cortes, D Lachowski, BCH Cheung, SA Karim, JP Morton and A del Rio Hernández, *Matrix stiffness induces epithelial-mesenchymal transition and promotes chemoresistance in pancreatic cancer cells*, Oncogenesis (2017), [doi:10.1038/oncsis.2017.54](https://doi.org/10.1038/oncsis.2017.54)

Zuzanna Brzosko, Sara Zannone, Wolfram Schultz, Claudia Clopath and Ole Paulsen, *Sequential neuromodulation of Hebbian plasticity offers mechanism for effective reward-based navigation*, eLife (2017), [doi:10.7554/eLife.27756](https://doi.org/10.7554/eLife.27756)

Luca A. Annecchino, Alexander R. Morris, Caroline S. Copeland, Oshiorenoya E. Agabi, Paul Chadderton, and Simon R. Schultz, *Robotic automation of in vivo two photon targeted whole-cell patch clamp electrophysiology*, Neuron (2017), [doi: 10.1016/j.neuron.2017.08.018](https://doi.org/10.1016/j.neuron.2017.08.018)

Christine-Maria Horejs, Jean-Philippe St-Pierre, Juha R. M. Ojala, Joseph A. M. Steele, Patricia Barros da Silva, Angela Rynne-Vidal, Stephanie A. Maynard, Catherine S. Hansel, Clara Rodriguez-Fernandez, Manuel M. Mazo, Amanda Y. F. You, Alex J. Wang, Thomas von Erlach, Karl Tryggvason, Manuel López-Cabrera and Molly M. Stevens, *Preventing tissue fibrosis by local biomaterials interfacing of specific cryptic extracellular matrix information*, Nature Communications (2017), [doi: 10.1038/ncomms15509](https://doi.org/10.1038/ncomms15509)

EXTERNAL GRANTS

Professor Martyn Boutelle (PI), awarded a Medical Research Council of the United Kingdom Fellowship for Sharon Jewell for the project *Identification of excitability profiles following acquired brain injury: A biomarker of neuronal health*. £235,797

Professor Anthony Bull (PI), awarded by the Secretary of State for Health via National Institutes of Health grant for the project *NIHR Group on POsT Conflict Trauma (ProTeCT)*. £1,882,124.60 (£619,648 to Bioeng)

Dr Claudia Clopath (PI), awarded by the Biotechnology & Biological Sciences Research Council grant for the project *Dopamine-induced hippocampal plasticity: A synaptic model of foraging in mice*. £185,983

Dr Tom Ellis (PI), awarded by the Biotechnology & Biological Sciences Research Council grant for the project: *Towards Genomes-to-Design Building & Testing a Minimal Essential Chromosome*. £394,192

Dr Firat Guder (PI), awarded a Wellcome Trust Seed Award for the project *Integrated Nucleic Acid Microsensor for On-Site Detection of Infectious Animal Diseases*. £100,000

Dr Huai-Ti Lin (PI), awarded the BBSRC grant for the project *Fly-by-feel: the neural representation of aeroelasticity in insects*. £541,822

Professor James Moore Jr (PI), awarded a Wellcome Trust Collaborative Award in Science for the project *Integrative Transport Phenomena in Chemokine Gradient Establishment*. £1,927,134 (£736,887 to Bioeng)

Dr Danny O'Hare (Co-I), awarded BRC Funding by the Imperial College Healthcare Trust NHS Trust for the project *Personalising antimicrobial dosing: Delivery through a novel closed-loop control systems incorporating transdermal monitoring and PK-PD indices*. £277,650.07 (£29,175 to Bioeng)

Dr Darryl Overby (PI), awarded by National Institute of Health via Duke University for the project *eNOS-Dependent Mechanoregulation of Intraocular Pressure*. £98,126

Dr Joseph Sherwood, awarded the RAEng Fellowship for the project *Interactions between fluid dynamics and biological function in microvascular disease*. £499,902

Dr Guy-Bart Stan & Dr Tom Ouldrige, awarded by the Engineering & Physical Sciences Research Council for the project *Genetically encoded nucleic acid control architectures*. £642,354

Dr Reiko Tanaka (PI), awarded a British Skin Foundation Small Grant Award for the project *Development of predictive models for the efficacy of atopic dermatitis treatments using machine learning methods*. £9,980