

Infectious Diseases & Immunity News

Biannual newsletter from the Department of Infectious Diseases & Immunity at the Hammersmith Campus of Imperial College London



I'm delighted to welcome as new members of staff Dr Darius Armstrong Jones, funded by the MRC and about whom there is more on page 3, and Dr Rosemary Boyton to our Section. Many of you will have met Rosemary and know she has been interested in respiratory infections and from an academic perspective is an immunologist. She is bringing with her a team of 5 people - please do all make them welcome. Another influx of course is a reminder that we are beginning to get pushed for space, which is an excellent sign! We are not at the point of needing to expand beyond the 8th floor although I hope that time will come! The new scientists coming with Rosemary and Darius have fitted into the lab where as everyone knows, space is given to individuals not groups.

You'll be aware that we have a very fertile Department in all directions! Congratulations to both our excellent laboratory manager Marta Archanco and to our first class DA, Caroline Renaud both of whom are pregnant. There will be locums employed to cover maternity leave. We also welcome Hanaa El Hachami as a new laboratory assistant to work alongside Rita Whiting.

In the research environment, no one is claiming that anything is easy. So, in a recent review, it was extremely encouraging to see that Infectious Diseases and Immunity came out top

both in the number of grants submitted and in the value of those grants. This reflects well not only on senior investigators but on all the post docs and students who are helping to formulate the preliminary data that lead on to the next series of grant applications. Well done all!

As Campus Dean I have initiated a new annual Christmas lecture to be given by a distinguished scientist. I am delighted to say that this year Professor Sir David Weatherall will be talking on the subject of 'Molecular Medicine: Lessons from the past for future developments' on Thursday 16th December. David Weatherall, Emeritus Regius Professor at Oxford University, has recently been awarded the extremely prestigious Lasker Special Achievement Award in Medical Science for his work in molecular medicine and leadership in tropical research. He will be talking at about 4.30pm and there will be campus Christmas drinks to follow. Look forward to seeing everyone there!

As winter approaches the clinical side of Infectious Diseases becomes increasingly busy. ID consultants are now undertaking daily ward rounds in the Acute Medical Unit. These have been very well received resulting in early discharge of patients on oral treatment or to the Outpatient Intravenous Antibiotic Service. The alternative is admission to John Humphrey ward, the ID focus for infection patients across the Trust.

Finally, you will be aware that our own Departmental Christmas party is arranged for Thursday 16th after the special lecture. It is moving to a new venue this year and hopefully it will be a good evening once again. I look forward to seeing you all there. In the meanwhile season's greetings and very best wishes for 2011!

Jon Friedland

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16 Dec, 4.15pm,
Wolfson Lecture Theatre 1

Prof Sir David Weatherall, Regius Professor of Medicine Emeritus, presents the inaugural Hammersmith Campus Christmas Lecture; 'Molecular Medicine: Lessons from the past for future developments'

Followed by drinks and nibbles to celebrate the Christmas season

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So where do I send my grant application next?

Danny Altmann offers valuable advice on how to secure future funding

Many of us woke on the morning of the government spending review feeling a bit like we felt on the morning of A-level results day. There had been dire predictions and the MRC had been holding back 20% of budget for the eventuality that there would be insufficient funds to fulfill existing obligations. Keen to show consistency, cuts at MRC Head Office had hit so hard that the old hand-cut chips for lunch had been replaced by curly tuna sandwiches. And, no jelly beans on the table.

There have been forecasts of the Next Great Extinction for academic departments with many predicted to seek new careers elsewhere. When the news came through of flat-funding across the research councils (and possibly better than that for the MRC), there was muted rejoicing. A plentiful spread was prepared for lunch at 20 Park Crescent. John Savill (the new Chief Executive) was upbeat and predicting that it may be possible to fund extra grants once the held-over 20% slices are returned to the pot. Nevertheless, the situation is still far from rosy.

So what can you do? Keep sending those grants in. If they've been rejected, tidy them up in light of the referees' comments and send them onto the next place. My experience at the MRC panel is that a feature of well-

funded, successful investigators is that you see applications from them lobbed in, meeting after meeting, sometimes successful, sometimes not. Please do make full use of the Department of Medicine pre-review process – not intended to delay, obstruct or irritate, but a way of utilizing all the grants panel experience we have around here to catch any blips before it's too late. Be eclectic in your choice of funders – European, US, charitable, clinical, basic science. People like Sarah Perkins and Chrystalla Orphanides are here to help you identify good funding opportunities. There will be a Roadshow at Hammersmith on December 9th to spread the word about grant funding opportunities. Don't forget that Clinical Training Fellowships from the MRC, Wellcome Trust and NIHR are still a great source for getting keen investigators and maintaining research momentum.

The Department of Infectious Diseases & Immunity which operates at the clinical science translational interface has had a great track record of getting such Fellowships at all levels. For more senior investigators, there are also the College Fellowships as well as the many external fellowship schemes.

Like all clichés, the one about you have got to be in it to win it is a cliché because it's a basic truth!

HEALTH & SAFETY NEWS

by Marta Archanco



Topics up for discussion at the last IDI Health & Safety committee meeting included the safety audit summary. IDI performed well and has a positive Health & Safety culture. To continue we are encouraged to strengthen our safety training records. Please look at the next training dates for MOST, RAFT, Biological Foundation Training and Fire Prevention and Fire Safety at Work (<http://www3.imperial.ac.uk/staffdevelopment/safety>).

The CWB recently passed the annual fire evacuation test. A building which hosts up to 1500 people was evacuated in 7 minutes. However, there's room for improvement; everyone on the 8th exited the building via the east staircase – remember that there is also a west staircase that can be used. When evacuating via the east staircase please leave the building at the ground floor, not via the Commonwealth main exit. Although lifts should be avoided during a fire alarm there is one exception. As we work in a restricted access area, a person travelling in the lift to the 8th floor without a swipe card, should stay in the lift until it defaults to the ground floor. Getting out on the lift could result in you being trapped in the lobby. Everyone must go directly to the fire assembly point in the north car park of the Hammersmith

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Darius Armstrong James returned to the department this Summer, here he talks about his past work and future research

It's great to be back-I never really felt like I've been away! As many of you will know I initially joined the Department in 2002 to undertake a PhD after junior doctor posts and an MSc in molecular biology at the London School of Hygiene and Tropical Medicine. My PhD was with the old Molecular Mycology group, comprising Tom Rogers, Ken Haynes, and Elaine Bignell. During my PhD I developed systems biology approaches to understand how fungi adapt to their mammalian host environment. A natural extension of that project was to try to start using microarray technology to define the immune response to aspergillosis *in vivo*. These studies enabled me to demonstrate an impaired interferon-gamma response and a Th17 profile in murine neutropenic aspergillosis.

After my PhD I undertook clinical training at Hammersmith Hospital. Whilst working for Sunil Shaanak it became clear that the immunological observations we made in our models of aspergillosis had parallels in transplant patients with invasive fungal infections. This led to a collaboration to develop novel interferon-gamma based diagnostics and therapeutics for invasive fungal infections. This collaboration enabled me to be awarded an MRC Clinician Scientist Fellowship, which now brings me back to the Department. In addition, I have now completed my clinical training and have accreditation in Internal Medicine, Infectious Diseases and HIV Medicine.

Over the next 4 years I will be undertaking controlled clinical studies to gain a greater understanding of both host and pathogen factors that lead to impaired immunity in invasive fungal disease. In addition I am developing a new model of aspergillosis that more accurately reflects the immunological deficits in patients on transplant immunosuppressive therapies. These synergistic studies will enable us to develop novel immuno-therapeutics for invasive

fungal infection. In addition, a further focus of the fellowship will be to undergo further post-graduate training in medical mycology. This will be achieved through the Diploma in Medical Mycology (UCL), ongoing clinical exposure to invasive fungal disease, and collaboration with my mentor, Prof. John Perfect at Duke University.



Darius returned to the department this Summer to work as a Senior Lecturer

I am joined by Susanne Herbst, who is a new PhD student/lab technician on the Fellowship. She completed her BSc in Lübeck before undertaking an Immunology Masters at the London School of Hygiene and Tropical Medicine. In addition I will be joined by Khojasteh Shirkhani in January who will also be a new PhD student investigating novel biopharmaceuticals for the prevention of invasive mold infections.

If you have exciting news or information for the next Infectious Diseases & Immunity newsletter please contact Rachel Wood; r.wood@imperial.ac.uk

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The Centre for Infection Prevention & Management held its first Annual Scientific Research Meeting in the Summer. Head of Operations **Juliet Allibone** provides a round-up of the Centre's recent achievements

The Annual Scientific research meeting this summer also marked The Centre for Infection Prevention & Management's (CIPM) first birthday. The Centre is a 5 year UKCRC funded project to integrate infection prevention into service delivery and is a close collaboration between IC, ICHT and the HPA. The day in June was a huge success and the Centre welcomed scientists, clinicians and other medical staff from various fields who came to learn about our research and progress so far. The meeting was opened by Lord Darzi and closed by Christine McCartney of the HPA. In addition representatives from the four CIPM work-streams *updated delegates about their research.*



Lord Darzi opened CIPM's conference this Summer

Since June the Centre has welcomed three new PhD students; Mark Reglinski working with Shiranee and Rob Edwards, Grahame Davis working with CIPM Lecturer, Lydia Drumright and Rachel Freeman is working with Alison Holmes and Mike Catchpole of the HPA. Members of staff have been busy over the past year submitting work and have had various abstracts and

posters accepted at prestigious national and international conferences. Examples include; *Developing new diagnostic tools for Staphylococcus aureus* Debra Smith, Magdalena Gierula, Angela Kearns, Barry Cookson, Rob Edwards, Shiranee Sriskandan. (ISSSI2010) and *NHS databases to support hospital epidemiology and surveillance*, L. García Álvarez, P. Aylin, J. Tian, M. Catchpole and A. Holmes (FIS). CIPM researchers have obtained a number of travel grants; Laura Garcia Alvarez was awarded the Hospital Infection Society Travel Award for attendance at International Conference on Antimicrobial Research in Spain. Carina King received the Hospital Infection Society Bursary to attend HIS conference in Liverpool and Zoe Seager was awarded the *European Society of Clinical Microbiology and Infectious Diseases* grant for attendance at the 3rd international clostridium difficile symposium in Slovenia.

Additional grant funding for CIPM has also been secured, including an SDO/NIHR grant and 2 collaborative BRC grants; *Analysis of norovirus and C. difficile co-carriage, co-infection and outcomes (Causal or Casual?)*, with Ian Goodfellow from the section of Virology and another lead by Shiranee Sriskandan and Rob Edwards entitled *Rapid Microbial Diagnosis by Mass Spectroscopy and Antibodies in Severe Sepsis*

The education work-stream has also been busy organising a study day on nurse advocacy and patient safety which took place this November to coincide with EU antibiotic awareness day. CIPM staff including Pharmacist Esmita Charani and Implementation Nurse, Rachel Edwards, were also invited to speak at the Imperial College Showcase Trust Conference this Autumn.

The date is already in the diary for next year's Annual Scientific Research meeting – it will take place on 16th June 2011 at Hammersmith House Conference Centre. So please pop the date in your diary now. We look forward to seeing you all there.



To learn more about CIPM's work, take a look at the website;

www.imperial.ac.uk/medicine/cipm

The date has already been set for the CIPM Annual Scientific Research Meeting 2011 which will take place Thursday 16th June at Hammersmith House Conference Centre.

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Mick Jones talks about his work with Imperial's MSc Molecular Medicine course

Usually the last week in September each year feels to me a little like 'Groundhog Day'! Preparing for the next intake of Mol Med MSc students takes on the 'I did this last year, and the year before that, and the year....' But, come the day the new students start in October and it all change and there's a host of new names and faces to remember. This year is our largest intake, 33 students; making the total number of students who have joined course to 310 since the course started in 1996, and 113 in only the last 4 years.

As in previous years, the students have come from all over the globe; apart from the usual regular places, Greece, Cyprus, Germany, China and the UK, we pick up some new 'flags' to stick into the course globe – Bulgaria, Belgium, Iran, Columbia, Mexico, Brazil and South Korea.

The course changes slightly each year, generally in the lecturers. There is no course syllabus as such, no standard content that has to be delivered, apart from some basic 'Core' material. Lecturers deliver talks on their subject area, laying out the background to the PIs particular gene or disease then building up to what is the latest in field and what they themselves are doing. The aim is the get the students excited about the biomedical research that is going on at Imperial. Some 90 academics lecture to the students

ensuring that the topics covered in are by experts in that field.

The last 6 months are taken up with a full-time research project, and is considered to be the best part of the course and the most enjoyable by virtually all the students, as they have the opportunity to get their 'hands dirty' with some real research.

About 50% of the students will go on to study for a PhD, a few get bitten by the medical bug and start on a medical degree. Some will decide enough is enough (I don't want to do another Western blot for the rest of my life), which is fine, as in the past these students may have started a PhD and then dropped out.

Overall our success rate is very high, as only 5 students (out of 310) have not left with an Imperial College MSc degree.

Congratulations to...

- **Naomi Walker** who saw off fierce competition to win an overseas Clinical Tropical placement and has been awarded a Wellcome Trust Clinical Tropical Training Fellowship
- **Susan Farrell** who was awarded a distinction in her Masters in Public Health

Head of Education for CIPM, Susan Farrell, brings us up-to-date with the department's Education programme

To coincide with EU Antibiotic Awareness Day, CIPM ran a study day aimed at nurses investigating the role of nurses in antimicrobial stewardship. The *Antimicrobial Management and Quality Improvement Course* attracted over 50 participants, from Imperial College Healthcare NHS Trust and other trusts in the UK. Speakers included Carole Fry, Nursing Officer Communicable Diseases from the Department of Health and Martin Kiernan, the former president of the Infection Prevention Society.

There are of course now two years of MSc Infection Management for Pharmacists running. The second years are now all deep in the middle of their research projects, which are all carried out at their base hospitals and the new cohort are just starting their second learning module on the *Basics of Antimicrobial Resistance*.

The Infection Seminars will have some external speakers over the coming weeks. Dr Bill Lynn is coming from Ealing to discuss some of his cases, Dr Sue Lightman (UCL) is discussing TB and the Eye and we are lucky enough to have a visit from Prof Joe Vinetz (University of California, San Diego) on the 25th January.

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Student **Robert Shaw** travelled to Peru this Summer to work with Dr David Moore's group

As a graduate-entry medical student with an interest, potentially following a career, in infectious disease, I jumped at the opportunity to spend 2 months in Peru during the summer break following the rather work-intensive first year of the course. I spent my time with Dr David Moore, a member of the Department who was based in Lima, Peru. By visiting Peru I hoped to get a better understanding of the kind of research work going on in infectious diseases and explore whether it was the area of medicine that I wanted to pursue. Although the 4 weeks were not long enough to get involved in a project in considerable depth, I was able to get a flavour of various projects involving Chagas (a major cause of cardiac morbidity), neurocysticercosis (a surprisingly common cause of epilepsy) and perhaps, most interestingly the MODS assay for TB. The arrival of the mobile MODS laboratory, during my stay there, was a particularly exciting time (photo). This means that a new lab can be delivered in a container lorry and set up



An impressive mobile laboratory arrived during Robert's time in Peru

anywhere from a fraction of the normal cost of establishing a lab. The opportunity to get involved with LimaKids - a Peruvian NGO helping street children - was also very rewarding.

There were several American medical students (including Fogarty scholars) who were taking varying amounts of time out from their degrees (up to 2 years in one case, who was investigating asthma in rural and urban settings). It was inspiring to see medical students with a passion to pursue their academic/clinical interests, who were straying from the standard path that

led directly to qualifications. This is something that is perhaps a bit more unusual in the UK.

I also spent 2 weeks in Iquitos, in the Amazon jungle under the auspices of NMRCD (Naval Medical Research Centre - Detachment Peru), where the most interesting were behavioural studies of the *Aedes aegypti* mosquito (the vector for the Dengue fever virus) which may have implications for public health.

All in all, my time in Peru was a very enjoyable and rewarding experience.

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John Humphrey Seminar Series take place on Thursdays, 1-2pm, Wolfson Lecture Theatre I

<p><u>11th November 2010</u></p> <p>Functional analysis of human monocytes</p> <p>Frederick Geissman Kings College London</p>	<p><u>25th November 2010</u></p> <p>Cross-talk between NK cells and T cells: relevance to vaccination</p> <p>Eleanor Riley London School of Hygiene & Tropical Medicine</p>	<p><u>2nd December 2010</u></p> <p>Innate regulation of adaptive immunity via dendritic cells</p> <p>Caetano Reis e Sousa Cancer Research UK</p>	<p><u>13th January 2011</u></p> <p>To die for the greater common good: macrophage cell death in innate immunity</p> <p>David Dockrell Dept of Immunity & Infection Sheffield University</p>
<p><u>20th January 2011</u></p> <p>Negative Regulation in the Innate Immune System</p> <p>Simon Arthur The MRC Protein Phosphorylation Unit University of Dundee</p>	<p><u>3rd February 2011</u></p> <p>Recent observations on the role of energy insufficiency in neuroinflammatory lesions</p> <p>Kenneth Smith Institute of Neurology University College London</p>	<p><u>10th February 2011</u></p> <p>Ubiquitin networks in immunity and inflammation</p> <p>Ivan Dikic Johann Wolfgang Goethe University Germany</p>	<p><u>24th February 2011</u></p> <p>The influence of TCR signals on T cell differentiation</p> <p>Rose Zamoyska Institute of Evolutionary Biology University of Edinburgh</p>
<p><u>3rd March 2011</u></p> <p>Gene and Immunotherapy</p> <p>Robert Hawkins School of Cancer and Imaging Sciences University of Manchester</p>	<p><u>10th March 2011</u></p> <p>Apoptosis in Cancer</p> <p>Gerry Melino MRC Toxicology Unit Leicester University</p>	<p><u>24th March 2011</u></p> <p>Llama antibodies that neutralise HIV-1</p> <p>Robin Weiss Wohl Virion Centre University College London</p>	<p><u>31st March 2011</u></p> <p>Autophagy in hematopoietic stem cells and Luekaemia</p> <p>Katja Simon The Weatherall Institute of Molecular Medicine University of Oxford</p>
<p><u>7th April 2011</u></p> <p>FcyRIIb controls the balance between defence from Infection and susceptibility to septic shock</p> <p>Ken Smith Cambridge Institute of Medical Research</p>	<p><u>14th April 2011</u></p> <p>Macrophage activation pathways during helminth Infection and allergy</p> <p>Judith Allen Institute of Infection and Immunology Research The University of Edinburgh</p>	<p><u>5th May 2011</u></p> <p>Novel Membrane protein expressed on helper T lymphocytes (Th), CD154</p> <p>Randy Noelle University College London</p>	<p><u>12th May 2011</u></p> <p>Bridging the innate and adaptive immune system</p> <p>Vincenzo Cerundolo The Weatherall Institute of Molecular Medicine University of Oxford</p>
<p><u>26th May 2011</u></p> <p>E4bp4 and NK cells</p> <p>Hugh Brady Imperial College London</p>	<p><u>2nd June 2011</u></p> <p>T-cell tolerance in the thymus microenvironments</p> <p>Graham Anderson School of Immunity and Infection The University of Birmingham</p>	<p><u>9th June 2011</u></p> <p>Immuno-regulatory pathways in atherosclerosis</p> <p>Ziad Mallat Dept of Medicine University of Cambridge</p>	<p><u>16th June 2011</u></p> <p>LAT signalling pathology: an autoimmune condition without T cell self-reactivity</p> <p>Bernard Malissen Centre d'immunologie de Marseille, France</p>

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Some recent publications

- **Armstrong-James, D.**, Stebbing, J., John, L., Murungi, A., Bower, M., Gazzard, B., Nelson, M. A trial of caspofungin salvage treatment in PCP pneumonia. *Thorax*. 2010; doi: 10.1136/thx.2010.135350.
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- **Ingram, R.J.**, Metan, G., Maillere, B., Doganay, M., Ozkul, Y., **Kim, L.U.**, Baillie, L., Dyson, H., Williamson, E.D., **Chu, K.K., Ascough, S.**, Moore, S., Huwar, T.B., Robinson, J.H., **Sriskandan, S., Altmann, D.M.** Natural exposure to cutaneous anthrax gives long-lasting T cell immunity encompassing infection-specific epitopes. *Journal of Immunology*. 2010; **184**: 3814-3821.
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