

Infectious Diseases & Immunity News

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



Welcome to the winter addition of the Newsletter and as we approach the festive period, the Department of Infectious Diseases and Immunity can look back on another successful and highly productive year.

Our grant income and research output both continue to increase confirming us as a successful unit within the Department of Medicine. Our success reflects the enthusiasm and high level aspirations of all those in the Department – it's great to see! Part of our strength derives from our diversity which stretches from policy and epidemiological research to complex molecular, immunological and biological studies. As a group, we understand the much hyped and frequently misused phrase 'translational research'. A recent impressive output is the award winning App for infection prescribing which is a result, in large part, of the work of Esmita Charani, Research Pharmacist.

Getting established as an academic is not easy but was the priority for Lydia Drumright who joined 18 months ago. She has driven forward a research team and won grants most notably a personal Fellowship for over £0.5 million from the National Institute of Health Research. She is now moving on to get more grants and publications. To my mind, this is the absolute blueprint of how to establish an academic career.

As ever, this year has seen a number of changes of personnel. Darius

Armstrong-James has been appointed as an Academic Clinical Senior Lecturer having obtained a MRC Intermediate Fellowship. Rosemary Boyton has come across from the Brompton campus with her group working on respiratory infections. On the other hand, Danny Altmann has been moving towards the Wellcome Trust and we shall be saying farewell (although not goodbye I hope) to him in 2012. Over the years Danny has been a key contributor to our efforts. Another retirement after long service was of Liz Bashford who, as many of you know, has recently been dealing with serious medical issues. Some of her work has now passed to my PA Amy who is an unassuming but invaluable member of the department. A number of key staff have been on maternity leave and we have been lucky with those who have stepped into the breach. I should like to mention Sara Yadav the excellent covering Head of Operations for the complex network that is the Centre for Infection Prevention & Management. We are delighted to welcome back from maternity leave, both our excellent Laboratory Manager, Marta Archanco and Departmental Administrator, Caroline Renaud.

It has also been an exciting year for teaching with many new courses most notably the 3rd MSc to be run from this department. This MSc in Infection is targeted at nurses and managers and has got off the ground in no small part due to the work of Suze Farrell, Head of Education who has also driven forward a whole raft of highly successful short courses in 2011.

Please put the Campus Christmas Lecture in your diary. I am delighted to say that this will be delivered on Wednesday 14th December by the new President of the Academy of Medical Sciences, Professor Sir John Tooke (details right), who is an excellent speaker. I look forward to seeing you all there and as an added incentive the

Campus Dean (i.e. Me) will be providing wine, soft drinks and canapés afterwards.

Finally, the Infectious Diseases and Immunity Christmas Party which is in an improved venue this year, will be at the 'Dartmouth Castle' on Monday 12th December from 6pm onwards.

Seasons greeting to all and I wish you a very successful 2012.

Jon Friedland

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14 Dec, 6pm,
Wolfson Lecture Theatre 1

Professor Sir John Tooke
presents the
Hammersmith Campus
Distinguished Christmas
Lecture; 'Towards
Sustainable Biomedical
Solutions'

Followed by a
drinks reception

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Congratulations to CIPM Research Pharmacist **Esmita Charani** whose Antibiotic Prescribing Policy iApp has won a national award

CIPM Research Pharmacist Esmita Charani has been instrumental in developing a smartphone application to help treat infections. The Imperial Antibiotic Prescribing Policy (iAPP) application, which was a collaborative initiative involving the Trust's Antibiotic Review Group and CIPM, was launched by the Trust on August 1st to coincide with new intake of junior doctors. It was well received by the Trust with 40% of junior doctors downloading it within the first month of release.

The iAPP's unique, password protected features include a decision support system to help prescribers choose the right anti-infective treatment for patients, and a clinical calculator to help with accurate and safe prescribing of medicines.

It's compatible with iPhones and Android phones and allows users point of care access to a digital version of our Trust's antibiotic treatment of infection policy.

Professor Alison Holmes, CIPM co-director and Trust director of infection prevention and control, said: 'This is the first app to be used within the Trust for policy or guidelines and it will reinforce and help support best practice in antibiotic prescribing.'

Chair of the Institute of Global Health Innovation at Imperial College London, Professor the Lord Darzi said: "This new prescribing app – developed by clinicians for clinicians – brings recommended guidelines to the

prescribers' pockets making it more likely that they will be followed. Most health professionals now carry smartphones and I strongly believe that clinicians will increasingly use them to support more evidence-based clinical decision making."



Esmita Charani . CIPM Pharmacist

The iAPP was used over 4800 times in the first month and has gained national recognition. It has been awarded an Antimicrobial Management Award 2011 from the UK Clinical Pharmacy Association (UKCPA) and Esmita received an individual OSC&R award.

This work has received national interest with other NHS organisations looking to develop similar applications and the team is keen to build on this success and develop further point of care applications to help with clinical quality improvement.

A presentation of the OSC&R by the Chief Executive of the Trust will take place on 7th Dec, 1.30pm, 2nd Floor, Hammersmith House. All are invited to attend.

HEALTH & SAFETY NEWS



I am back in business as Laboratory Manager, H&S officer and working mum. For the past 6 months I have done more risk assessments than in my entire life! Having a baby is a good training for all infectious diseases so, somehow, I now feel more prepared for work. "I've got E.coli in the dishwasher, toxic fungus on the bath mat and goodness knows what festering in the toy box". Not me talking, that's what Daily Mail's journalist Charlotte Kemp wrote after College BioRisk manager Anton de Paiva visited her place last summer. A few swabs were enough to discover how we can be responsible for spreading germs at home and from home. The full online article can be found here <http://www.dailymail.co.uk/femail/article-2019527/Will-dishwasher-food-poisoning.html#ixzz1c5SQSEAZ>. Maybe it is one of my new mum's paranoia (the temptation to play domestic goddess) but that's what I've been reading while I've been away and just felt like sharing it with you.

Back to work, H&S committees at Campus, Department and Section levels have taken place in the past month. Minutes will be widely distributed and I'll be working with you in the required actions. I'm happy to be back on board.

Marta Archanco

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CIPM Implementation Nurse, **Rachel Edwards** learnt that her systemic review would be published in *The Lancet Infectious Diseases*. Here is a summary of her research

Reference: Edwards R, Charani E, Sevdalis N, Alexandrou B, Sibley E, et al. (2011) Optimising Infection Prevention and Control Practice using Behaviour Change: A systematic review. *The Lancet Infect Diseases*. In press.

A systematic review performed by Rachel Edwards and CIPM colleagues was accepted by *The Lancet Infectious Diseases* in October, 2011. This review identified behavioural intervention studies for prevention of healthcare associated infections (HCAIs) and assessed these for effectiveness, sustainability and the extent to which behavioural intervention studies incorporated psychological or social marketing frameworks. Additionally, exploratory literature was reviewed for insight into

healthcare worker (HCW) perceptions of the facilitators and barriers to the adoption of new infection prevention and control (IPC) behaviours. In total, 9,123 abstracts/titles were reviewed and from these, 573 full text articles were assessed, and twenty one (5.5%) of the studies met inclusion and quality criteria for narrative synthesis. Few behaviour change interventions of sufficient methodological quality or adequate outcome evaluation were identified. Of the seven intervention studies included, few explicitly considered psychological frameworks or addressed sustainability, and while some contained elements of social marketing, none were specifically social marketing studies. Exploratory studies (n=14) effectively highlighted some of the social and cultural determinants of

HCW behaviour in IPC. This review demonstrated that the quality of interventions aimed at changing the IPC behaviours of HCWs has been poor, and although exploratory studies are often based in psychological theory, intervention studies have rarely applied psychological theory or a social marketing framework. To improve the standard of research and the evidence-base in this field, the authors made recommended quality criteria to be added to existing guidelines to ensure robust design, implementation and reporting of behaviour change interventions in IPC. Exploratory studies provided useful insight into influences of HCW behaviour and better utilisation of this in formative research for behaviour change interventions would be constructive.

Rachel plans to return to Australia early next year and her last day gave the CIPM team opportunity to thank her for all the hard work and contribution she had given to the team. A presentation during the day was followed by dinner and drinks in the evening. Rachel hopes to pursue research initiatives with the department



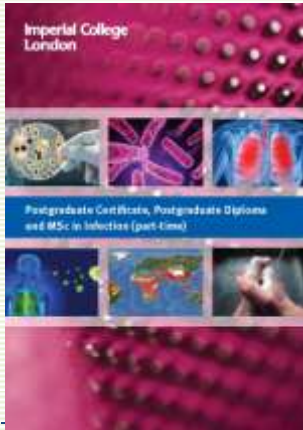
(Above) Yiannis Kyratsis, Rachel Edwards, Sid Mookerjee and Grahame Davis from CIPM joined Rachel at her leaving dinner. (Right) Earlier in the day, Alison Holmes presented Rachel with her gift from the team.



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Susan Farrell introduces the new MSc Course



The new MSc in Infection course started this year with a cohort of 13 nurses and microbiology graduates. The first teaching week was held in October with staff from the departments of Infectious Diseases and Immunity and Microbiology delivering an entire week of lectures to the students. The students received a wide range of lectures, from the basic concepts of bacterial classification, through mechanisms of action for antibacterials to more clinical lectures about immunology and infection management. The end of the week saw their first assessment, which was to deliver a presentation about a clinical case. All the students must complete two more modules to gain a Postgraduate Certificate and when that is finished they

can choose to continue on for the Postgraduate Diploma or the MSc.

Congratulations

- Lydia Drumright awarded a Fellowship by the NIHR
- Esmita Charani who has been awarded a Trust OSC&R for her work on the antibiotic prescribing iApp.



- Darius Armstrong James who was appointed Academic Clinical Senior Lecturer
- Catherine Ong (pictured above) who received a Presidential Award from Dr. Elizabeth Kovacs, President of the US Society for Leukocyte Biology in Kansas

Five minutes with...



Name: Rachel Wood

What I do: I work part-time as the CIPM Team Secretary.

What my job involves: I work closely with the Head of Operations to provide administrative support to members of the team and ensure the centre runs smoothly. I'm also responsible for writing the CIPM newsletters, working on promotional material for the Centre and I'm also involved in organising the main event in CIPM's calendar; the Annual Scientific Research Meeting which takes place in June.

What I enjoy most about my role: As a 5 year project there are always new tasks arising throughout the cycle of the centre, so I enjoy the variety that the role brings. CIPM is a collaborative initiative and I enjoy acting as a point of contact for professionals and organisations and helping to facilitate their work with CIPM.

How do you spend the rest of your working week? I work as a Food Stylist, which basically involves cooking the food and 'styling' it for photography. I work on cook books, TV shows, press features and advertising campaigns. For a foodie it's a dream job and I feel lucky to have found something which allows me to be creative in the workplace and allows me to continually learn about the thing I am passionate about.

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Naomi Walker shares her experience of a year spent working in Uganda

In October 2010, having spent 2 years as an Academic Clinical Fellow in Infectious Diseases at the Hammersmith, I was given the opportunity to spend a year in Uganda, at Mbarara University of Science and Technology (MUST) Medical School and the adjacent referral hospital.

Having worked in the NHS for years, I was well accustomed to the difficulties doctors-in-training face: long hours, night shifts, waiting time targets, crash calls, bleep systems, DOPS and mini-CEXs. How would this prepare me for life as a doctor in Southwest Uganda, 6,395.....and a million miles away?



I was relieved on arrival, in the bustling town of Mbarara, to find that my 1 hour commute to Hammersmith, was to be replaced by a few minutes walk. I was housed across the road from the hospital, in a leafy, well-kept compound. Avocado trees, pelicans, blue skies: these were my new surroundings. The road was the main highway between Kampala and Kigali. Day and night trucks laden with produce: bananas, livestock, sugar cane, beer, trundled noisily past.

Mbarara Regional Referral hospital, is a 300-bed government run hospital, with medicine, surgery, obstetrics and gynaecology, paediatrics and psychiatry and a large outpatients department. Staff are overworked and underpaid, but overwhelmingly dedicated. Sound a bit like the NHS? Maybe, but it was relatively common for them not to be paid at all for several months or more.

Patients travel there from far and wide, at great personal cost. Distance measured by the price of fuel. Follow up frequency is dictated by finances.

In Uganda, admitting a patient to hospital requires the assistance of an "attendant", a family member willing to undertake their basic nursing care. In addition, attendants are required to visit the pharmacies and laboratories in town, fetching medicines and test results. Only limited services are provided freely by the hospital: blood smears for malaria, HIV testing, basic microbiology.

Medical ward is a vibrant and busy place. Up to 100 patients are attended to daily by interns and senior house officers, training for a Masters in Medicine. The Department hosts a varied programme of seminars and international speakers. Research is a major focus (e.g. Muzoora et al J Infect Nov 2011). A study investigating the optimal timing of anti-retroviral therapy in Cryptococcal Meningitis is currently underway.



HIV prevalence rates have been estimated at around 6%, but are much higher amongst in-patients. Tuberculosis is a big problem, with an incidence rate of 330 per 100 000 pop/year. Patients with smear positive TB are transferred to TB ward, an 8-bed isolation unit at the rear of the hospital. However, identifying these patients early, to avoid the risk of nosocomial transmission, is difficult. Suboptimal TB treatment regimens and poor access to drugs may

have contributed to the concerning emergence of drug-resistant TB. Culture of sputum and other specimens for mycobacteria is not routinely undertaken so drug-resistance is often diagnosed late.

A typical Monday involved lecturing the medical students, an inpatient ward round and lunch of steamed matooke (savory banana) with G-nut (peanut) sauce and goat. Afternoons comprised ward referrals and seminars, followed by an evening ward round of new admissions. On a bad day, the admissions room would be overflowing, oxygen supplies run-out and evening power cuts, meaning ward rounds in the dark. On a good day, a bed would be available for each new patient and oxygen and medications to hand. I didn't take anything for granted.

I was surprised by similarities between life at the Hammersmith and life at MUST. I found it a stimulating environment where patient care was combined with a strong focus on research and education. The overwhelming difference was the hardship experienced by the patients in Mbarara, in terms of financial costs, lack of equipment, unreliable electricity supplies and medication. I will never complain about the NHS again.....

In the current era of well-defined training pathways, e-portfolios, specialty certificate examinations and workplace based assessments, taking time out-of-programme to work abroad may not always seem wise, or be encouraged. However, my experience has given me a new perspective, been stimulating, rewarding and fun, and for that reason I am a strong advocate.

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John Humphrey Seminar Series take place on Thursdays, 1-2pm

Here are some examples of past speakers and future visitors to campus

<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>
<p><u>30th June 2011</u></p> <p>Novel membrane protein expressed on helper T lymphocytes (Th), CD154</p> <p>Randy Noelle University College London</p>	<p><u>6th October 2011</u></p> <p>Structure and function of lymph node stroma in regulating immune responses</p> <p>Mark Coles - University of York <i>LT 1 Wolfson Education Centre</i></p>	<p><u>20th October 2011</u></p> <p>Using switchable genetics to identify effective therapeutic cancer targets</p> <p>Gerard Evan FRS - University of Cambridge <i>LT 1 Wolfson Education Centre</i></p>
<p><u>3rd November 2011</u></p> <p>Innate Immune responses in acute HIV-1 Infection: Protective or Pathogenic?</p> <p>Persephone Borrow – University of Oxford <i>LT 1 Wolfson Education Centre</i></p>	<p><u>10th November 2011</u></p> <p>The role of the TCR in early thymic T cell development</p> <p>Daniel Pennington - Queen Mary, University of London <i>LT 1 Wolfson Education Centre</i></p>	<p><u>17th November 2011</u></p> <p>Antigen-specific enhancement and suppression of immunity by adoptive T cell transfer</p> <p>Hans Stauss – University College London <i>LT 1 Wolfson Education Centre</i></p>
<p><u>24th November 2011</u></p> <p>The role of the lymphoid microenvironment in immunosenescence</p> <p>Donald Palmer, Royal Veterinary College, University of London <i>LT 1 Wolfson Education Centre</i></p>	<p><u>1 December 2011</u></p> <p>Combined approaches to preventing HIV infection: vaccines and ART prevention</p> <p>Robin Shattock St Mary's Campus, Imperial College London <i>LT 2 Wolfson Education Centre</i></p>	<p><u>15th December 2011</u></p> <p>Analysis of macrophages found during the resolution of acute inflammation</p> <p>Derek Gilroy- University College London <i>LT3 Wolfson Education Centre</i></p>

If you have any information for the next newsletter, please contact Rachel Wood; r.wood@imperial.ac.uk

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Some recent publications

- Oberhelman, R.A., Soto-Castellares, G., Gilman, R.H., Caviedes, L., Castillo, M.E., Kolevic, L., Del Pino, T., Saito, M., Salazar-Lindo, E., Negron, E., Montenegro, S., Laguna-Torres, V.A., **Moore, D.A.J., Evans, C.A.** Diagnostic approaches for paediatric tuberculosis by use of different specimen types, culture methods, and PCR: a prospective case-control study. *The Lancet*. 2020; **10**: 612-620.
- **O’Kane, C.M., Elkington, P.T., Jones, M.D.,** Caviedes, L., Tovar, M., Gilman, R.H., Stamp, G, **Friedland, J.S.** STAT3, p38 MAPK, and NF- κ B drive unopposed monocyte-dependent fibroblast MMP-1 secretion in tuberculosis. *Am J Respir Cell Mol Biol*. 2010; **43**: 465-474.
- Reddy, K.P., Brady, M.F., Gilman, R.H., Coronel, J., Navincopa, M., Ticona, E., Chavez, G., Sánchez, E., Rojas, C., Solari, L., Valencia, J., Pinedo, Y., Benites, C., **Friedland, J.S., Moore, D.A.J.** Microscopic observation drug susceptibility assay for tuberculosis screening before isoniazid preventive therapy in HIV-infected persons. *Clinical Infectious Diseases*. 2010; **50**: 988-996.
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- **Chu, K.K.,** Tippayawat, P., Walker, N.J., Harding, S.V., Atkins, H.S., Maillere, B., Bancroft, G.J., Lertmemongkolchai, G., **Altmann, D.M.** CD4⁺ T-cell immunity to the *Burkholderia pseudomallei* ABC transporter LolC in melioidosis. *Eur. J. Immunol*. 2011; **41**: doi: 10.1002/eji.201040881.
- Coello, R., **Brannigan, E.,** Lawson, W., Wickens, H., **Holmes, A.** Prevalence of healthcare device-associated infection using point prevalence surveys of antimicrobial prescribing and existing electronic data. *Journal of Hospital Infection*. 2011; doi: 10.1016/j.jhin.2011.01.028.
- Dhesi, Z., Stebbing, J. The HVTN 503/Phambili study: efficacy is always the issue. *The Lancet*. 2011; DOI:10.1016/S1473-3099(11)70103-7.
- **Drumright, L.N., Holmes, A.H.** Monitoring major illness in health care workers and hospital staff. *Clinical Infectious Diseases*. 2011; **53(3)**: 284-286.
- **Edwards, R., Drumright, L.N.,** Kiernan, M., **Holmes, A.** **Covering** more territory to fight resistance: considering nurses’ role in antimicrobial stewardship. *Journal of Infection Prevention*. 2011; **12(1)**: 6-10.
- **Edwards, R.,** Loveday, H., **Drumright, L.N., Holmes, A.** Should nurses be more involved in antimicrobial management? *Journal of Infection Prevention*. 2011; **12: (1)**. 4-5.
- **Elkington, P.T.,** D’Armiento, J.M., **Friedland, J.S.** Tuberculosis immunopathology: The neglected role of extracellular matrix destruction. *Science Translational Medicine*. 2011; **3(71 71ps6)**: 1-4.
- **Elkington, P.,** Shiomi, T., Breen, R., Nuttall, R.K., Ugarte-Gil, C.A., **Walker, N.F.,** Saraiva, L., **Pedersen, B.,** Mauri, F., Lipman, M., Edwards, D.R., Robertson, B.D., D’Armiento, J., **Friedland, J.S.** MMP-1 drives immunopathology in human tuberculosis and transgenic mice. *J Clin Invest*. 2011; doi:10.1172/JCI45666.
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- **Green, J.A.,** Chau, T.T.H., Farrar, J.J., **Friedland, J.S.,** Thwaites, G.E. CNS infection, CSF matrix metalloproteinase concentrations, and clinical/laboratory features. *Neurology*. 2011; **76**: 577-579,
- Hausteiner, T., Gastmeier, P., **Holmes, A.,** Lucet, J.C., Shannon, R.P., Pittet, D., Harbarth, S. Use of benchmarking and public reporting for infection control in four high-income countries. *The Lancet*. 2011; **11**: 471-480.
- Jen, M.H., Saxena, S., Bottle, **A., Aylin, P.,** Pollok, R. Increased health burden associated with *Clostridium difficile* diarrhoea in patients with inflammatory bowel disease. *Alimentary Pharmacology and Therapeutics*. 2011; **33(12)**: 1322-1331.
- **Wilson, J.,** Guy, R., Elgohari, S., Sheridan, E., Davies, J., Lamagni, T., Pearson, A. Trends in sources of methicillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia: data from the national mandatory surveillance of MRSA bacteraemia in England, 2006 – 2009. *Journal of Hospital Infection*. 2011; **79**: 211-217.