

# Infectious Diseases & Immunity News

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



Every time I think about this newsletter I'm amazed at how much news there is and how many dynamic people are in our Section of Imperial. As ever, I shall select a few highlights.

I'm delighted to welcome Rosemary Boyton's research group, the Lung Immunology Group, who are integrating with Danny Altmann's group. I am sure they will bring exciting new perspectives to research in the Department. Congratulations are in order as Rosemary has been promoted to Reader! This continues the unbroken line of promotions supported by Infectious Diseases & Immunity for over 7 years now.

Congratulations also to Paul Elkington for being appointed to a new blood HEFCE Clinical Senior Lectureship in a highly competitive process. This will allow his great work within the TB Research Group to continue, as typified by the recent paper in Journal of Clinical Investigation.

The Departmental Open Day, held in May, was a great success. Thanks to all who helped with the event, particularly my PA Amy – without whom it wouldn't have happened. I am grateful to all who guided groups on lab tours and to everyone who came along to speak with the visitors. We had about 30 interested people visit to discuss potential opportunities for clinical and non-clinical Fellowships. Although it's too early to know whether there will be new recruits, early signs are encouraging. We produced brochures about what

we do so if you are going to a meeting do take some with you and spread the news about us – ask Amy for some.

The National Centre for Infection Prevention and Management which is based in our Section celebrated its 2<sup>nd</sup> Annual Scientific Research Meeting on 16<sup>th</sup> June. The event was opened by the Rector who had great things to say about the Centre, and Claire Perry, the Trust Managing Director, closed the day, which is reflection of the Centre philosophy to take academic research and turn it into patient benefit. Didier Pittet from University of Geneva and a world leader in control of HCAI gave an interesting overview and was followed by updates from those doing the research in the Centre including interesting talks from collaborators from across Imperial and the Health Protection Agency. The day was driven by Juliet Allibone, Director of Operations, who went into labour the following day! I am pleased to report that mother and daughter are doing well!

This is a good moment to welcome the high quality team covering different maternity leaves. There is Alan Simm, lab manager, Deborah McKenna who is Dept Administrator and Sara Yadav who is CIPM Director of Operations. Other new faces have joined various research groups and although space prevents me from naming them, I extend a warm welcome to all. I hope everyone is settling in well and just to remind everyone, if there are any concerns, suggestions or good news that you wish to discuss, I operate an open door policy for all. The Department is very busy and that is a great! I look forward to the day we need to expand beyond the 8<sup>th</sup> floor!

Education and capacity building is core to the Dept. Recently, Susan Farrell, Head of Education for CIPM has been working hard to set up our 3<sup>rd</sup> MSc course which is in Infection and targeted at nurses and managers. Even in the first

year in these financially straightened times, we anticipate about a dozen students starting in October. The website has all the information about educational opportunities so spread the word!

Over in the hospital, the development of daily ID rounds on acute medicine wards have had a major impact improving patient outcomes whilst reducing costs; an audit completed by Dr Jo Seddon, an Academic Clinical Fellow currently working in South Africa, has highlighted a long list of positives. For example, some patients are being discharged to the highly successful outpatient antibiotic service led by Frances Sanderson whilst others are being admitted more rapidly to John Humphrey ward for care.

Finally, I hope that you all have an enjoyable Summer – keep up the good work!

Jon Friedland

## Summer issue 2011

Welcome	1
Academic report	2
Health & Safety news	2
CIPM update	3
Education	4
Student view	5
John Humphrey Seminars	6
Recent publications	7

# Infectious Diseases & Immunity News

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

Research – challenging old paradigms in tuberculosis, Jon Friedland

In tuberculosis, the long held view has always been that the infection results in caseous necrosis and this in some way causes tissues to collapse allowing cavity formation, spread of infection and contribute to inflammatory tissue damage. In our group, we have been developing a different paradigm which we have recently outlined in the journal Science Translational Medicine. We agree that immune mediated inflammatory tissue damage causes both dissemination of infection and symptomatic tissue destruction which may lead to mortality (approaching 2 million people still die each year from TB and many more have chronic complications of tissue damage during acute infection). However, we cannot accept that formation of a lipid rich caseous material, although clearly characteristic of tuberculosis, can be seen to drive this process. Rather, our paradigm is that tissue damage results from over-activity of the innate immune response and in particular, activation of a family of enzymes able to destroy all components of the matrix at neutral pH. These enzymes which I started developing an interest in 14 years ago now, are called matrix metalloproteinases.

Paul Elkington, now funded by a competitively awarded HEFCE new blood clinical Senior Lecturer award, has long been involved in the MMP story and for the last few years has been leading a complex series of cellular and human investigations combined with studies in a MMP-I knock-in mouse which have demonstrated neatly that MMP-I turns the fibrotic murine TB model into one more resembling human disease with tissue destruction and collagen breakdown. Such animal work is long and painstaking since experiments last many months in tuberculosis but Paul's patience with the model has been rewarded and the data is now present for all to see in the paper in Journal of Clinical Investigation highlighted below. Congratulations to all those who have been involved in the project but particularly to Paul who took on the murine model and kept the whole project moving in the right direction!

<http://www.ncbi.nlm.nih.gov/pubmed/21519144?dopt=Citation>

<http://www.ncbi.nlm.nih.gov/pubmed/21346167?dopt=Citation>

## HEALTH & SAFETY NEWS

by Alan Simm



Alan Simm is covering for Marta Archanco until her return in October and has assumed her role as Departmental Safety officer.

Our Department has a high level of Health & Safety Awareness. Recently we've conducted a review of our compliance with the Anti-terrorism Crime & Security legislation including our holdings of bacterial toxins. Our performance is entirely compliant and we passed the inspection without criticism.

The recent ID Safety Committee meeting raised a number of important issues. We should all be aware that we are a target for casual criminal activity and one should not leave valuables unattended in unsecured areas. We shall be focusing on laboratory tidiness as an area for improvement. As a busy research department there is a lot of experimental work. This can lead to lab aisles being cluttered and benches untidy. This presents not only "trip" dangers but also microbiological hazards as benches/cabinets need to be cleaned and disinfected regularly to prevent cross contamination of work.

Deborah Chong is now the Departmental Radiation Protection Supervisor for the department. Alan recently organised a training course on <sup>3</sup>H monitoring using the liquid scintillation counter. If you need training in the use of the LSC please see Alan.

# Infectious Diseases & Immunity News

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

The Centre for Infection Prevention & Management  
Annual Scientific Research Meeting, by Sara Yadav

The National Centre for Infection Prevention and Management held its 2nd Annual Scientific Research Meeting on 16th June with fascinating presentations on translational research from Centre researchers and collaborators from the Health Protection Agency and elsewhere. The event was opened by the Rector, Professor Sir Keith O’Nions, and concluded with remarks from Claire Perry, Managing Director of ICHNT. Also in attendance was Lord Christopher Tugendhat, Chairman of the Trust’s Board of Directors, and Professor Sir Tony Newman-Taylor, Principal of the Faculty of Medicine. The international significance of CIPM was recognised by Professor Didier Pittet, Director of the Infection Control Programme, University of Geneva Hospitals and WHO External Programme Lead (pictured right); he is a member of the Centre International Strategy Board.

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

[www.imperial.ac.uk/cipm](http://www.imperial.ac.uk/cipm)



The event was closed by Claire Perry, Managing Director, Imperial College Healthcare NHS Trust.



Clockwise from top: Members of the audience listen to one of the speakers at the ASRM; Didier Pittet, Director of Infection Control, University of Geneva; CIPM Research Associate Hema Sharma and ID PhD student Lucy Lamb from the department attended the ASRM,



# Infectious Diseases & Immunity News

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

## E Learning – The way forward...

### By Suze Farrell

Learning for healthcare professionals, or any working professional, presents new challenges relating to delivery. Healthcare professionals may not be able to take long periods of study leave for courses, and with the current financial climate travelling to and from London for courses is not always feasible for those further afield than the M25! One potential answer to these problems is the introduction of e-learning. This allows the flexibility of learning at your own pace, in your own environment and at your chosen time.

At the moment our courses all have an e-learning component, we record as many lectures as possible and upload these so students can watch them again or download them as podcasts to listen to while revising. These lectures are recorded in real time and provide a 'picture in picture' view of the lecturer with their powerpoint presentations.

This e-learning component will be expanding from October 2011 with the change in format to our courses. New short modules will be introduced to give the students more information to study while they are not in residence at the College. By providing a mix of styles of teaching, both face-to-face and online, we will be catering for the different learning styles of the students and hopefully get excellent exam marks as a result!

### Congratulations to:

**Sunil Shaunak** whose biotechnology spinout company, Indigix was awarded Series A funding by Imperial Innovations

**Rosemary Boyton** who became a Reader

**Paul Elkington** appointed HEFCE Clinical Senior Lectureship

## Five minutes with...



**Name:** Stephanie Plant

**What I do:** I'm the Education Assistant with CIPM.

**What my job involves:** I administer the MSc in Infection Management for Pharmacists which includes all administrative duties needed for general day to day running of the course. This includes inviting lecturers to speak, coordinating sessions and ensuring all materials are available for the students.

**When do I work:** I'm employed for 2 days a week and work Tuesdays and Thursdays.

**What I enjoy most about my role as Education**

**Assistant:** I enjoy coordinating the sessions and making people feel welcome when they come to speak at Imperial.

**How do you spend the remainder of your working week?** I also work three days a week at the National Theatre as an HR Assistant where I deal mostly with recruitment and other general administrative duties.

# Infectious Diseases & Immunity News

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

## Two students talk about their time spent with the department



**I'm an external intercalated BSc student from Brighton and Sussex Medical School and I have been studying Immunity and Infection at Imperial College.**

During my BSc project I have been working within the department of infectious diseases and immunology with the tuberculosis research group.

My project involved investigating the role of matrix metalloproteinase-10 (MMP-10) in tuberculosis tissue destruction. Other MMPs had been implicated in this tissue destruction however little was known about this one in particular. Before this project I knew little about research within a laboratory and so everything was novel to me. At first it took time to learn different techniques however the research group were really helpful and friendly. It was daunting remembering where everything was kept and ensuring experiment protocols were followed. I quickly found out that research was not a fast process and if

a mistake was made it often meant hours were lost. It involved a lot of hard work but was definitely worth it when I achieved successful results. I have gained valuable skills such as being able to work within a team and I have a greater understanding of the research process. My project was very enjoyable and I hope to undertake more laboratory research and develop my interest in infectious diseases in the future.

Laura Stuttaford



**As an infectious diseases registrar I have always wanted to do some research and see it as integral to broadening and strengthening my career.**

The beauty of the Academic Clinical Fellow (ACF) scheme is that it naturally integrates clinical specialist training with a foundation in research with the aim of producing clinical researchers who work at the interface of translational medicine.

The decision to move sideways into lab work was partly influenced by the expertise offered by the infection Department at Imperial but also by my long-standing interest in TB. This six month block of research will enable me to learn new lab techniques, generate some preliminary data and put together a proposal for a PhD.

Research feels like a world away from ward work: the pace and lifestyle are different and more controlled, but being able to make an experiment work and manipulate the data is something quite new and often unfathomable. I am really enjoying the intellectual challenge of research and by leaving behind clinical constraints, it feels that I can concentrate wholeheartedly on the research questions at hand rather than try to juggle the two

threads simultaneously. I have been surprised by how interactive and sociable life on the research side is and also how exciting it is to be performing new experiments and gathering new data.

As part of my research I am heading out to Durban, South Africa to establish a link between Imperial College and the KwaZulu-Natal research institute for tuberculosis and HIV (K-RITH). It will be an exciting opportunity to take my career in a different direction, collaborate with experts from all over the world and work at the coalface of the TB/HIV epidemic.

Jo Seddon

# Infectious Diseases & Immunity News

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

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

Below is a list of the speakers who visited Hammersmith over the last few months. The new season of seminars will start again in October 2011

<p><u>3<sup>rd</sup> March 2011</u></p> <p><b>Gene and Immunotherapy</b></p> <p>Robert Hawkins School of Cancer and Imaging Sciences University of Manchester</p>	<p><u>10<sup>th</sup> March 2011</u></p> <p><b>Apoptosis in Cancer</b></p> <p>Gerry Melino MRC Toxicology Unit Leicester University</p>	<p><u>24<sup>th</sup> March 2011</u></p> <p><b>Llama antibodies that neutralise HIV-1</b></p> <p>Robin Weiss Wohl Virion Centre University College London</p>
<p><u>31<sup>st</sup> March 2011</u></p> <p><b>Autophagy in hematopoietic stem cells and Leukaemia</b></p> <p>Katja Simon The Weatherall Institute of Molecular Medicine University of Oxford</p>	<p><u>7<sup>th</sup> April 2011</u></p> <p><b>FcyRIIb controls the balance between defence from Infection and susceptibility to septic shock</b></p> <p>Ken Smith Cambridge Institute of Medical Research</p>	<p><u>14<sup>th</sup> April 2011</u></p> <p><b>Macrophage activation pathways during helminth Infection and allergy</b></p> <p>Judith Allen Institute of Infection and Immunology Research The University of Edinburgh</p>
<p><u>5<sup>th</sup> May 2011</u></p> <p><b>Autophagy in hematopoietic stem cells and leukaemia</b></p> <p>Dr Katja A Simon University Research Lecturer Weatherall Institute of Molecular Medicine</p>	<p><u>26<sup>th</sup> May 2011</u></p> <p><b>E4bp4 and NK cells</b></p> <p>Hugh Brady Imperial College London</p>	<p><u>2<sup>nd</sup> June 2011</u></p> <p><b>T-cell tolerance in the thymus microenvironments</b></p> <p>Graham Anderson School of Immunity and Infection The University of Birmingham</p>
<p><u>9<sup>th</sup> June 2011</u></p> <p><b>Immuno-regulatory pathways in atherosclerosis</b></p> <p>Ziad Mallat Dept of Medicine University of Cambridge</p>	<p><u>16<sup>th</sup> June 2011</u></p> <p><b>LAT signalling pathology: an autoimmune condition without T cell self-reactivity</b></p> <p>Bernard Malissen Centre d'immunologie de Marseille, France</p>	<p><u>30<sup>th</sup> June 2011</u></p> <p><b>Novel membrane protein expressed on helper T lymphocytes (Th), CD154</b></p> <p>Randy Noelle University College London</p>

If you have any information for the next newsletter, please contact Rachel Wood; [r.wood@imperial.ac.uk](mailto:r.wood@imperial.ac.uk)

# Infectious Diseases & Immunity News

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

## Some recent publication

- **Ingram, R.J., Chu, K.K.,** Ketan, G., Maillere, B., Doganay, M., Ozkul, Y., Dyson, H., Williamson, E.D., Baillie, L., **Kim, L.U., Ascough, S., Sriskandan, S., Altmann, D.M.** An epitope of *Bacillus anthracis* protective antigen that is cryptic in rabbits may be immunodominant in humans. *Infection and Immunity*. 2010; **78(5)**: 2353-2354.
- **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.
- **Uddin, J.,** Gonzalez, A.E., Gilman, R., **Thomas, L.H.,** Rodriguez, S., **Evans, C.A.W.,** Remick, D.G., Garcia, H.H., **Friedland, J.S.** Mechanisms regulating monocyte CXCL8 secretion in neurocysticercosis and the effect of antiparasitic therapy. *Immunology*. 2010; **185**: 4478-4484.
- Kotturi, M.F., Botten, J., Maybeno, M., Sidney, J., Glenn, J., Bui, H.H., Oseroff, C., Crotty, S., Peters, B., Grey, H., **Altmann, D.M.,** Buchmeier, M.J., Sette, A. Polyfunctional CD4+ T cell responses to a set of pathogenic arenaviruses provide broad population coverage. *Immune Research*. 2010; **6:4**. doi:10.1186/1745-7580-6-4.
- **Kurupati, P., Turner, C.E.,** Tziona, I., Lawrenson, R.A., **Alam, F.M.,** Nohadani, M., Stamp, G.W., Zinkernagel, A.S., Nizet, V., Edwards, R.J., **Sriskandan, S.** Chemokine-cleaving *Streptococcus pyogenes* protease SpyCEP is necessary and sufficient for bacterial dissemination within soft tissues and the respiratory tract. *Molecular Microbiology*. 2010; doi:10.1111/j.1365-2958.2010.07065.x
- 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- $\kappa$ 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.
- **Chu, K.K.,** Tipayawat, P., Walker, N.J., Harding, S.V., Atkins, H.S., Maillere, B., Bancroft, G.J., Lertmemongkolkhai, G., **Altmann, D.M.** CD4<sup>+</sup> 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.
- **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.
- Flower, B., **Armstrong-James, D.,** Dance, C., Bremner, F., Doherty, T. Blind, breathless, and paralysed from benign malaria. *The Lancet*. 2011; **377 January 29**: 438.
- **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.