10th & 11th September 2009: "Regulation of the Immune System in Health and Disease."

Durkan Lecture Theatre, Institute of Molecular Medicine, Trinity Centre for Health Sciences, St. James's Hospital, Dublin 8

This year’s annual ISI conference will be held on September 10th and 11th in the Institute of Molecular Medicine, St. James Hospital, Dublin 8. The programme for the 2009 conference boasts an impressive array of top national and international immunologists. This year’s meeting will touch on key topics in the immunology field – namely, inflammation, transplant and tolerance, vaccine and adjuvants and infection and evasion strategies.

The ISI prides itself each year in showing the young immunology talent here in Ireland. We have 14 allocated oral presentation slots and ample room for poster presentations for PhD student/PostDoc candidates over the course of the two-day meeting. Thanks to generous sponsorship (see programme for details), excellent prize money is available for the best (& runner-up) oral- and poster-presentations.

We have received some excellent abstracts to date but if you have yet to submit yours, you are in luck as the deadline has been extended until the 31st of August. Log onto our website, www.irishimmunology.ie and follow the 2009 registration links.

**FINAL ABSTRACT DEADLINE:**
**MONDAY, 31ST AUGUST!!**

**August 2009**

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**Poster Presentations:**

**Poster Boards:** Poster boards will be available at the meeting, which will accommodate posters in PORTRAIT FORMAT ONLY and up to A0 in size (91cm x 122cm).
ISI ANNUAL MEETING 2009
KEYNOTE SPEAKER:

Prof. Irun R Cohen

Mauerberger Professor of Immunology
The Weizmann Institute of Science
Department of Immunology, Rehovot
Israel.

Email: irun.cohen@weizmann.ac.il

We are extremely honoured to have the distinguished immunologist, Prof Irun R. Cohen open our 2009 meeting with a keynote lecture. Prof. Cohen has worked for many years on Autoimmune diseases; T cells; Natural autoimmunity and Immune system modelling. No doubt an insightful and highly enjoyable lecture is in store for us on Thursday, the 10th of September.

Prof. Cohen was awarded the Robert Koch Prize, Federal Republic of Germany, for his work on autoimmunity. He is a Highly Cited Researcher (ISI), with over 480 professional publications and over 16,000 citations. His major contributions include: Development of cloned T cells as functional probes for the analysis of autoimmune diseases; Discovery of immune regulation by T cell vaccination – currently in phase 2 clinical trials for treatments of multiple sclerosis, lupus and arthritis; Development of the concept of the immunological homunculus in the regulation of autoimmunity, natural and pathogenic; Peptide vaccination therapy (peptide p277) of type 1 Autoimmune Diabetes – presently in phase 3 clinical trials; Co-inventor of Reactive Animation – a computer-assisted, visual language for interactive simulation of complex systems; development of a new platform for conjugate vaccines; and development of the antigen microarray chip for bioinformatic analysis of immune system patterns.

At this year’s ISI Meeting, Professor Cohen will be presented with the prestigious European Federation of Immunological Societies (EFIS) and Immunology Letters (EFIS-IL) Lecture Award and Medal.

http://www.weizmann.ac.il/immunology/iruncohen/
The programme for the 2009 conference boasts an impressive array of top national and international immunologists. Here, is a brief synopsis of our invited speaker’s research interests – just to whet your appetite for what promises to be a very informative and enjoyable meeting!

**SESSION 1: INFLAMMATION**

Prof. Kevin Maloy, Oxford University, UK  
kevin.maloy@path.ox.ac.uk

“How IL-23 drives intestinal inflammation”

The key interest of Prof. Kevin Maloy’s research lies in understanding how immune responses are controlled in the intestine and on how host-pathogen interactions contribute to intestinal pathology. His group has a particular interest in innate immunity as this part of the immune system decides when and how to respond to pathogenic invaders. Over-activation of innate immunity has been implicated in human inflammatory bowel disease (IBD). Another focus of his research is immune regulation. Prof. Maloy’s group have established a novel experimental model in mice where infection with *Helicobacter hepaticus* triggers potent inflammatory responses in the intestine due to hyper-activation of innate immunity. Using this model to examine how innate immune responses are controlled in the intestine, he has recently shown that IL-12 is not required for intestinal inflammation, but disease is actually driven by the closely related cytokine, IL-23.

Prof. Kingston Mills, Trinity College Dublin  
Kingston.mills@tcd.ie

“More than just an endogenous pyrogen – the role of IL-1 in directing inflammatory T cells”

A key element of Prof Mill’s research focuses on the role of T cells and inflammatory cytokines in infection induced neuro-inflammation and in neurodegenerative conditions. A recent focus has been the role of gamma delta T cells in experimental autoimmune encephalomyelitis (EAE), a model for multiple sclerosis. Another key area in Prof Mill’s research group is immune regulation, examining the balance between regulatory and effector/pathogenic T cells in models of infection and autoimmune diseases with a particular interest in manipulating this balance as a promising approach for the treatment of
diseases with an immunological basis. His work on Treg cells has also led his group to examine the role of these cells in subverting anti-tumor immunity.

Prof. John O'Shea, osheaj0@mail.nih.gov

“Transcriptional and epigenetic control of T cell differentiation”

Prof. O'Shea has authored more than 225 articles and book chapters and is a recognized authority in cytokine signal transduction. Prof. O'Shea has been a leader in dissecting the role of Jaks and Stats family transcription in immunoregulation. He and his colleagues cloned the tyrosine kinase, Jak3, and demonstrated its role in pathogenesis of severe combined immunodeficiency. Prof. O'Shea was awarded a US patent related to Janus Family Kinases and identification of immune modulators (7,070,972). Recently, he and colleagues at the NIH identified the role of Stat3 in regulating T cell cytokine production in Job's syndrome.

Prof. O'Shea was the recipient of the 2009 Irish Society for Immunology Public Lecture Award. Each year the recipient of the Award is invited to present a public lecture on their work and how it pertains to health. Prof. O'Shea illustrated how uncovering the molecular basis of two rare immunodeficiency diseases provided the rationale for developing a new class of immunosuppressant drugs to treat autoimmune diseases such as rheumatoid arthritis, psoriasis and inflammatory bowel disease.

SESSION 2: TRANSPLANT AND TOLERANCE

Prof. Brigit Sawitzki, Charite Hospital, Berlin birgit.sawitzki@charite.de

“Immune monitoring and therapeutic refinement in transplantation”

Prof. Sawitzki’s main research focus is Transplant Immunology with the aim of establishing more clinically relevant transplant models. She is involved in a post transplant monitoring program for patients receiving tolerance inducing therapies and conventional immunosuppressive drug. Her group examines the mechanisms of CyA mediated tolerance abrogation. Prof. Sawitzki’s research group generates and characterises both
Prof. Michael Clarkson

CUH- Consultant Renal Physician and Clinical Senior Lecturer in Nephrology

M.Clarkson@ucc.ie

“Co-stimulatory blockade in renal transplantation”

A key factor driving the underlying pathophysiology of chronic rejection in organ transplantation is a persistent T cell-mediated alloimmune response. Members of both the B7 family (including CD28 and CTLA4) and the tumor necrosis factor (TNF) family, in which the CD40-CD154 pathway is preeminent, play key roles in the T cell response following alloantigen presentation. Positive costimulatory molecules promote full T cell activation, whereas a subgroup of costimulatory molecules delivers negative costimulatory signals that function to downregulate alloimmune responses. Prof. Clarkson’s group examines the potential of the novel costimulatory pathways as targets for tolerance induction in CD28-independent alloresponses.

Dr. Bernard Mahon,
NUIM
bp.mahon@nuim.ie

“Adult mesenchymal stem cells as therapeutic agents for immunomodulation”

Dr. Mahon’s group have discovered features of stem cells which may mean that adult derived stem cells might be used in a wide variety of new therapies. Firstly, his group have shown how CD4+ T cells alter or “license” these stem cells, making them less amenable to rejection; second the stem cells themselves alter dendritic cells to dampen immunity, and finally the stem cells induce a type of regulatory CD4+ T cell that suppresses rejection. Thus there is an elaborate cross talk between the immune system and the stem cell to bring about tissue repair. In effect, stem cells create a tolerogenic milieu. His group are uncovering the fundamental processes that will benefit future patients, and support new biotechnology and pharmaceutical industries.

SESSION 3: VACCINES AND ADJUVANTS

Prof. Adrian Hill,
Oxford University, UK
adrian.hill@well.ox.ac.uk
The main research objectives of Prof’s Hills group are to understand the genetic basis of variable susceptibility to malaria, tuberculosis and leprosy in African and Asian populations along with the genetic and acquired basis of variable immune responses to malarial parasites and mycobacteria. His group is also heavily involved in the development and trial of new vaccines suitable for inducing cytotoxic T lymphocytes that will protect against these pathogens. In addition Prof. Hill has forged collaborations with other groups to investigate the genetic determinants of susceptibility to persistent infections and disease with Hepatitis B and C viruses, and those of host susceptibility to Staphylococcal and Pneumococcal disease. Host genetic susceptibility to HIV-1 has also been investigated.

Dr. Oliaro and others have shown that a dividing T lymphocyte initially responding to a microbe exhibits unequal partitioning of proteins that mediate signaling, cell fate specification, and asymmetric cell division. Asymmetric segregation of determinants appears to be coordinated by prolonged interaction between the T cell and its antigen-presenting cell before division. Additionally, the first two daughter T cells displayed phenotypic and functional indicators of being differentially fated toward effector and memory lineages. These results suggest a mechanism by which a single lymphocyte can apportion diverse cell fates necessary for adaptive immunity.

Many currently used and candidate vaccine adjuvants are particulate in nature, but their mechanism of action is still being elucidated.

Dr. Ed Lavelle,
Trinity College, Dublin
lavellee@tcd.ie

“Particulate vaccine adjuvants enhance cell-mediated immunity by activating the NALP3 inflammasome”
action is not well understood. Dr. Lavelle’s Adjuvant Research Group have shown that particulate adjuvants, including biodegradable poly(lactide-co-glycolide) (PLG) and polystyrene microparticles, dramatically enhance secretion of IL-1β by dendritic cells. Lavelle and co-workers have shown that the ability of particulates to promote IL-1β secretion and caspase 1 activation required particle uptake by DCs and NALP3.

**SESSION 4: INFECTION AND EVASION STRATEGIES**

*Prof. Cory Hogaboam, University of Michigan Medical School, US hogaboam@umich.edu*

“Toll-like receptor regulation of pulmonary innate and adaptive immune responses to the fungal pathogen, *Aspergillus fumigatus*”

Prof. Cory Hogaboam’s major research interests encompass mechanisms that regulate immune and inflammatory events during allergy and asthma. His group have recently developed a chronic model of *A. fumigatus*-induced airway inflammation that exhibits the characteristic pulmonary phenotype of asthmatics, incorporating local and systemic allergic inflammation. Although some of these features are present in other murine models of allergic airway disease, the advantage of this fungal asthma model is its chronicity with responses lasting months rather than hours.

Prof. Andrew Bowie,
Trinity College, Dublin
agbowie@tcd.ie

“Insights into innate immune signalling from viral evasion studies”

Prof. Bowie’s group studies the poxvirus, vaccinia virus (VACV) to gain an understanding into the mechanisms whereby viruses evade and neutralise the host immune system. Through this work his group has yielded valuable insights as to how the host immune machinery functions, since viruses often specifically target key points of regulation of immunity. Prof. Bowie’s research team have identified two VACV proteins, A46R and A52R, that can not only antagonise intracellular TLR signalling, but also subvert these pathways for the benefit of the virus. Current on-going investigations are seeking to characterise the mechanism of inhibition of TLR signalling by A46R and A52R, and to exploit the therapeutic potential of peptides derived from them.
In April 2008 I attended the Keystone Symposium focusing on Pattern Recognition Molecules and Immune Sensors of Pathogens, this was also a joint meeting with Dendritic Cell biologists. The meeting was held in the picturesque setting of Banff, a small town nestled in the Canadian Rocky Mountains. The Keystone Symposia have a renowned reputation for bringing together world class scientists and this meeting was no exception. This was my first international conference so naturally expectations were high and this gathering did not disappoint as the meeting packed in over 30 oral presentations and several hundred poster presentations into 3 short days.

The joint opening plenary session began with a talk from Shizuo Akira (Osaka University) who spoke about the role of autophagic proteins in inflammation which was followed by Ira Mellman (Genetech) who discussed the complex topic of tolerance and the effect that the maturation state of dendritic cells (DCs) has on the induction of tolerance. Luke O’Neill (Trinity College) opened proceedings on the following day and began the session which focused solely on TLRs. He introduced us to a protein called TAG which his data has shown to be responsible for turning off toll signalling through its interaction with trif, thus adding another layer of complexity to the TLR-signalling system. Following on from this Ruslan Medzithov (Yale) presented data which proposed that the similar responses induced by parasitic worms and allergens, which originate from various organisms, is due to the presence of a common factor, such as a protease. He went on to show that basophils were the key antigen presenting cells in a papain induced allergen model, leaving dendritic cells redundant.

Nod-like receptors took centre stage on the second day with Jenny Ting (University of North Carolina) opening proceedings. Her talk highlighted the fact that many of the 22 nlr genes found in humans have been linked to diseases. She presented data which showed that NLRP-3 played an important role in viral clearance and the generation of an adequate immune response in a murine H1N1 influenza model. Vishva Dixit (Genentech) continued the NLRP-3 theme by presenting data which showed that glyburide, a sulfonylurea drug normally used in the treatment of diabetes, has the ability to inhibit activation of the NALP-3 inflammasome in response to known stimuli. John C Reed (Burnham institute for medical research) described his work on the Bcl-2 family members focusing on the cross talk between these
cell death proteins and members of the nod-like receptor family. His data showed that overexpression of Bcl2 suppresses IL-1 but has no effect on cell survival, suggesting a novel role for Bcl-2 in regulation of the inflammasome. Jurg Tschopp (University of Luasanne) presented some novel and interesting data proposing the existence of a memory T-cell population which through CD40 have the ability to inhibit IL-1 production by antigen presenting cells and macrophages thereby inducing adaptive immune responses while reducing collateral damage that can be caused by inflammatory cytokines.

The following day started with a session on viral sensors during which Kate Fitzgerald (University of Massachusetts) presented data showing the existence of a novel inflammasome comprising of AIM2 and ASC with no NALP proteins. Furthermore, this inflammasome can be activated by dsDNA inducing secretion of IL-1β and knockdown of AIM2 abrogated activation of caspase-1 in response to dsDNA and the dsDNA virus, vaccinia.

The final day began with a joint plenary session which focused on PRRs in dendritic cells and macrophages. Gordon Brown (University of Cape Town) discussed the role of dectin-1 in fungal recognition. Dectin-1 is a non-Toll-like signalling molecule which recognises β-glucans and induces phagocytosis and oxidative burst along with the transcription of several cytokines and chemokines by signalling through its ITAM-like motif. His data showed that in order to induce optimal anti-fungal responses that several PRRs must be engaged including dectin-1, TLR-4/7 and mannose receptors. Alan Sher (NIH, Bethesda) described a novel in vitro system which enabled them to identify a T2 ribonuclease, omega-1, as the main Th2 driving factor isolated from Shistosoma mansoni. His work showed that Omega-1 drives a pre-dominantly Th2 response by lowering the DC-T-cell interaction time therefore reducing the strength of the signal received and lowering the antigen dose required.

Ralph Steinman (Rockfeller University) provided the concluding remarks to the joint conference. He reminded us that our knowledge of innate immune recognition can and should be translated into the development of novel vaccines and therapies.

Note from the Editor
***Calling all ISI members for suggestions, comments and articles***

Do you have a scientific meeting you’d like to tell us about? A suggestion for our career focus piece? Any suggestions/comments for any other article that you think would interest our members? Don’t be shy, email us, we would love to hear from you!

See you all on the 10th and 11th of September for what promises to be our best meeting yet!

Sarah Higgins. Editor, ISI Newsletter. Email: irishimmunology@gmail.com
ISI ANNUAL MEETING, 10th & 11th September 2009.
“REGULATION OF THE IMMUNE SYSTEM IN HEALTH AND DISEASE”
Durkan Lecture Theatre, Institute of Molecular Medicine,
Trinity Centre for Health Sciences, Trinity College Dublin,
St. James's Hospital, Dublin 8.

THURSDAY, 10TH SEPTEMBER

08.45 – 09.45  Registration, Trade Exhibition & Tea/Coffee

09.45 – 09.50  Conference Open/Welcome:
               Dr Aideen Long (Trinity College, Dublin), President, Irish
               Society for Immunology.

09.50 – 10.30  KEYNOTE LECTURE
               Title TBA
               Professor Irun Cohen (The Weizmann Institute of Science,
               Israel)

SESSION 1:  INFLAMMATION
            Chairs: TBA.

10.30 – 11.00  How IL-23 drives intestinal inflammation
               Professor Kevin Maloy (Oxford University, UK)

11.00 – 11.15  Selected Oral Presentation.
11.15 – 11.30  Selected Oral Presentation

11.30 – 12.00  Tea/Coffee.

12.00 – 12.30  More than just an endogenous pyrogen – the role of IL-1 in
               directing inflammatory T cells
               Professor Kingston Mills (TCD).

12.30 – 12:45  Selected Oral Presentation.
12:45 – 13.00  Selected Oral Presentation.

13.00 – 13:30  Transcriptional and epigenetic control of T cell
               differentiation
               Professor John O’Shea (National Institutes of Health,
               Bethesda, USA)

13:30 – 14:30  Lunch, Posters and Trade Exhibition
SESSION 2: TRANSPLANT & TOLERANCE
Chairs: TBA.

14.30 – 15.00 Immune monitoring and therapeutic refinement in transplantation
Professor Brigit Sawitzki (Charite Hospital, Berlin)

15.00 – 15.15 Selected Oral Presentation.
15.15 – 15.30 Selected Oral Presentation.

15.30 – 16.00 Co-stimulatory blockade in renal transplantation
Professor Michael Clarkson (UCC)

16.00 – 16.30 Tea/Coffee.

16.30 – 16:45 Selected Oral Presentation.
16.45 – 17.00 Selected Oral Presentation

17.00 – 17.30 Adult mesenchymal stem cells as therapeutic agents for immunomodulation
Dr Bernie Mahon (NUIM)

17.30 – 19.15 Poster Session, Wine Reception & Trade Exhibition.
19:30 - LATE Banquet Dinner, The Hilton Hotel, Kilmainham, Dublin 8.

FRIDAY, 11TH SEPTEMBER

SESSION 3: VACCINES & ADJUVANTS
Chairs: TBA.

09.00 – 09.30 Vectored vaccines for malaria and pandemic flu
Professor Adrian Hill (Oxford University, UK)

09.30 – 09.45 Selected Oral Presentation.
09.45 – 10.00 Selected Oral Presentation.

10.00 – 10.30 Asymmetric cell division of T cells upon antigen presentation utilizes multiple conserved mechanisms
Dr Jane Oliaro (Melbourne)

10.30 -11.00 Tea/Coffee.

11.00 – 11.30 Particulate vaccine adjuvants enhance cell-mediated immunity by activating the NALP3 inflammasome
Dr Ed Lavelle (TCD)

11.30 – 11.45 Selected Oral Presentation.

11.45 – 12.45 Short Presentations from Selected Student Posters.
(5 Students: 4 min talk + 2 min questions)
Chair: TBA.
12:45 – 13.45  Lunch and Posters and Trade Exhibition.

SESSION 4:  INFECTION & EVASION STRATEGIES
Chairs: TBA.

13.45 – 14.15  Toll-like receptor regulation of pulmonary innate and adaptive immune responses to the fungal pathogen, Aspergillus fumigatus
Professor Cory Hogaboam (University of Michigan Medical School. US)

14:15 – 14:30  Selected Oral Presentation.

14:30 – 15.00  Insights into innate immune signalling from viral evasion studies
Professor Andrew Bowie (TCD)

15.00 – 15.30  Tea/Coffee.

15:30 – 15:45  Selected Oral Presentation.
15:45 – 16.00  Selected Oral Presentation.

16:00– 16:30  Prizes to be awarded:

Oral Presentation Prizes:

Best oral presentation: €350 prize
Sponsored by Abbott Laboratories

Best oral presentation, runner-up: €200 prize
Sponsored by Cruinn Diagnostics Ltd

Poster Presentation Prizes:

Best poster presentation: €350 prize
Sponsored by Abbott Laboratories

Best poster presentation, runner-up: €200
Sponsored by Abbott Laboratories

Best student poster presentation: €250 prize
Sponsored by (TBA)

Best student poster presentation, runner-up: €100
Sponsored by Abbott Laboratories

16:30  Close of Conference.
16:30  Irish Society for Immunology, AGM.