

The 2013 three Rs Event: Toll like receptors (TLRs),RIG-like receptors (RLRs) and Nod-like receptors (NLR)

Thursday, 26th September 2013
The Penridge Suite, 470 Bowes Road, London N11 1NL

The aim of this meeting is to provide an overview of these three families of receptors and provide the most recent advances in the area of innate immune pattern recognition

Meeting chairs: Dr Martha Triantafilou/Professor Kathy Triantafilou, Cardiff University School of Medicine, UK

This event has CPD accreditation and will have a troubleshooting panel session.

On registration you will be able to submit your questions to the panel that will be asked by the chair on the day of the event

- 9:00 – 9:45 Registration
- 9:45 – 10:00 **Introduction by the Chairs:** Dr Martha Triantafilou/Professor Kathy Triantafilou, Cardiff University School of Medicine, UK
- 10:00 – 10:30 **Talk title to be confirmed**
Dr Katrin Rittinger, MRC National Institute for Medical Research, London, UK
- 10:30 – 11:00 **Talk title to be confirmed**
Dr Mark Paul-Clark, National heart and Lung Institute, London, UK
- 11:00 – 11:30 **Speakers' photo then mid-morning break and trade show**
- 11:30 – 12:00 **Talk title to be confirmed**
Professor David Haig, School of Veterinary Medicine and Science, Nottingham University, UK
- 12:00 – 13:00 **Talk to be confirmed**
- 13:00 – 14:00 **Lunch and trade show**
- 14:00 – 14:30 **Question and Answer Session**
Delegates will be asked to submit questions to a panel of experts. Questions can be submitted before the event or on the day
- 15:00 – 15:30 Afternoon Tea/Coffee and trade show
- 15:30– 16:00 **Talk to be confirmed**
Dr Clare Bryant, University of Cambridge, UK
- 16:00 - 16:30 **Pattern recognition receptor in Gram-negative intracellular infections: friends or foes?**
Dr Pietro Mastroeni, Cambridge Veterinary School, UK
Pattern recognition receptors are important for the expression of immunity to bacterial infection and modulate aspects of the development of acquired immunity. However in some cases their stimulation can lead immune paralysis and to suppression of the host response.
- 16:30 Chairman's summing up

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This meeting was organised by Euroscicon (www.euroscicon.com), a team of dedicated professionals working for the continuous improvement of technical knowledge transfer to all scientists. Euroscicon believe that they can make a positive difference to the quality of science by providing cutting edge information on new technological advancements to the scientific community. This is provided via our exceptional services to individual scientists, research institutions and industry.

About the Chairs

Over the past few years the Triantafyllou group has been focusing on unravelling the molecular mechanisms behind the innate recognition of bacterial as well as viral pathogens. In particular, we have focused on the involvement of the Toll like receptor (TLR) family of proteins, a recently identified family of pattern recognition receptors (PRRs), in the innate immune sensing. We have the expertise and the research tools for investigating receptor interactions using bioimaging techniques, such as Fluorescence Resonance Energy Transfer (FRET), Fluorescence Recovery after Photobleaching (FRAP), Single Particle Imaging (SPFI), Single Particle Tracking (SPT), Fluorescent Loss in Photobleaching (FLIP) as well as live cell imaging. Using combinations of these techniques, our group has discovered novel concepts in innate immune recognition of microbial ligands by TLRs and co-operating PRRs. We have been one of the first to demonstrate that the single receptor concept of innate immune recognition is an oversimplified one and that different combinational associations of receptors determine the innate immune response to different microbial pathogens, using a range of non-invasive biophysical techniques. We performed several studies investigating associations of PRRs in response to bacterial products from *Helicobacter pylori*, *Neisseria meningitidis*, and bacterial lipopeptides. Furthermore, we demonstrated that membrane microdomains, or "lipid rafts" play an important role in this receptor cluster formation by providing a microenvironment for these interactions to take place. This was the first ever publication demonstrating that TLRs exist and signal within lipid rafts (making this paper one of the most cited papers in the field). We provided the first dynamic picture of TLR engagement by their ligand by determining the lateral diffusion of receptors involved in the innate immune response before and after stimulation by bacterial products. It has helped us understand the organisation, lateral mobility and confinement of PRRs involved in the innate immune response on the plasma membrane. In addition, using fluorescent imaging, we have revealed that TLR2 exists as a heterodimer prior to ligand engagement, as well as its intracellular trafficking and targeting in response to Gram-positive bacterial products. More recently, we have demonstrated that CXCR4 acts as a negative regulator for TLR2 and its significance in the innate recognition of *Porphyromonas gingivalis* (Hajishengallis et al. 2008). This was the first study demonstrating that TLR2/CXCR4 association can impair innate immune responses. Finally, we have shown that TLR4, TLR7 and TLR8 are involved in sensing viral products. These were the first studies to reveal how enteroviruses are recognised by the innate immune system

About the Speakers

Katrin Rittinger obtained a degree in chemistry from the University of Heidelberg, Germany. She then went on to do a Ph.D. at the Max Planck Institute for Medical Research in Heidelberg in the group of Roger Goody, characterising the nucleotide and oligonucleotide-binding properties of HIV reverse transcriptase and the mechanism of action of non-nucleoside RT inhibitors. After a short postdoctoral period at the Max Planck Institute for Molecular Physiology in Dortmund, Germany, she came to NIMR in 1996 for a second postdoc, working on the structural characterisation of 14-3-3 ligand complexes and the regulation of Rho family GTPases. In 2000 she established her own research group and has since studied a number of protein assemblies that regulate different aspects of signal transduction using biochemical and structural methods. In addition, the group collaborates with other Divisions at NIMR to extend the experimental approaches available to answer a given biological question.

Mark Paul-Clark is an accomplished researcher with a number of publications in leading journals. He has established a track record in attracting independent funding and contributes significantly to both postgraduate and undergraduate teaching. Dr Paul-Clark's research focuses upon understanding the process of inflammation with a particular interest in oxidants and the damage they cause. Most recently he has concentrated his research into the area of pattern recognition receptors and inflammation. He completed his PhD with Professor Derek Willoughby before joining Professor Roderick Flower and Professor Mauro Perretti for his postdoctoral training. In 2002 Dr Paul-Clark joined Professor Jane Mitchell's group to study the role of pattern recognition receptors, including Toll like receptors, in inflammation. Since this time Dr Paul-Clark was awarded a Research Fellowship from the British Lung Foundation and a University award from the Wellcome Trust, with which he will take up an academic lectureship position within Cardiothoracic Pharmacology.

Clare Bryant - 1985 BSc (Hons) Biochemistry and Physiology, University of Southampton, 1989 BVetMed, University of London, 1992 PhD, University of London. 1992-1995 Wellcome Trust Veterinary Research Training Fellowship, sRoyal Veterinary College,

University of London, 1995%1996 Research Scientist, William Harvey Research Institute, London, 1996 -2000 Wellcome Trust Research Career Development Fellow and 2000%2003 Wellcome Trust Research Advanced Fellow, Department of Clinical Veterinary Medicine, The University of Cambridge, 2003%University Lecturer and Senior Lecturer in Clinical Pharmacology, Department of Veterinary Medicine, The University of Cambridge. Research Interests: Role of Pattern Recognition Receptors (PRRs) in bacterial infection; species specificity in PRR activation.

Pietro Mastroenis' is a Reader at the University of Cambridge. He obtained a Degree in Medicine and Surgery at the University of Messina, Italy prior to moving to the UK where he obtained a PhD at the Department of Pathology of the University of Cambridge and worked as a postdoctoral Fellow at Imperial College, London.

His research has established several landmarks in the fields of pathogenesis of bacterial infections, immunity, immunoevasion and vaccine development.

His research group is currently pioneering the use of innovative multidisciplinary approaches towards a global understanding of infection dynamics in the face of immunity and vaccination.

Keywords: Innate Immunity, DNA sensing, Inflammasome, Type I interferon, RLHs, TLRs, Interferon, rhinovirus, asthma, TLR4, rhinovirus, LPS, TLR, signal transduction, scaffold complexes, NLR, PRR, LPS, Salmonella, Innate Immunity, atherosclerosis, NLRP3, Inflammasome, IL1, infection, immunity TLRs, bacteria

Registration Web Site: www.regonline.co.uk/TOLL2012

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- You will be issued with a FULL delegate list within 14 days of the event, which will include the email addresses of the delegates (we are sorry that there is this delay in emailing the list, but we need to make sure that it takes into account any late arrivals). You will not be included in this list if you have opted out and you can do this by logging into your registration details. This list will not be sold or ever give out to third parties. Only people attending or sponsoring the event have access to the list
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- Please remember that EuroSciCon is a small independent company with no subsidies from society memberships or academic rates for venues. We try to be