

The Global Public Health implications of Tropical Diseases Research

The BioPark Hertfordshire, Welwyn Garden City, AL7 3AX: 24th February 2011

"Although there is a rush of technological advancement in the tropical countries, by accepting the super technological approach in handling diseases like cardiovascular diseases, kidney diseases, diabetes, rare neurological disease etc, the most commonly encountered diseases in the tropical countries, such as infectious diseases (leprosy, drug resistant tuberculosis, leishmaniasis, malaria filariae as well as common cancers like oral cancer and immunodeficiency vs malnutrition) are not getting enough attention. This meeting will explore the new technological advances and research currently being undertaken to eradicate these neglected diseases and discuss the greater implications these will have to global public health". Meeting Chair: Professor P.K. Das, University of Amsterdam, The Netherlands

This meeting has CPD approval

- 9:00 – 9:45 **Registration**
- 9:45 – 10:00 **Introduction by the Chair: Professor P.K. Das, University of Amsterdam, The Netherlands**
- 10:00 – 10:35 **Global Health in the Tropics. Barriers and perspectives**
Professor Francesco Castelli, University of Brescia, Italy
In Developing Countries a severe burden of infectious diseases caused by an array of different types of viruses, bacteria, worms and parasites is associated to poverty, malnutrition, scarce hygiene and dirty drinkable waters. These diseases share population targets, ecological niches and wide distribution with HIV/AIDS, tuberculosis and malaria, with extremely high public health impact. Research investments on control, prevention and drugs for diseases that are confined to poor countries are poor, even if increasing in the last decade. Strong political and scientific commitment is urgently needed to improve prevention, diagnosis and treatment of poverty-related diseases in Developing Countries
- 10:35 – 11:20 **MHC/NK interactions and disease**
Professor John Trowsdale, Cambridge University, UK
The highly polymorphic MHC class I and class II genes are intimately involved in susceptibility to both infectious and autoimmune disease. Receptors on Natural Killer (NK) cells interact with MHC class I molecules. NK receptors are also polymorphic and are on a different chromosome to the MHC ligands. The independent inheritance of variable receptor and ligand leads to combinatorial effects on disease resistance
- 11:20- 11:25 **Speakers photo**
11:25 – 12:00 **Mid-morning break**
- 12:00 – 12:35 **Diagnostics of Leprosy**
Dr. Annemieke Geluk, Leiden University Medical Center, The Netherlands
Preclinical *M. leprae* infection is a major source for leprosy transmission. Therefore, early detection of individual infected with *M. leprae* is crucial. However, to date there are no tests available that can identify preclinical leprosy. HLA based bio-informatic tools combined with comparative genomics recently allowed us to identify *M. leprae* unique antigens. Evaluation of IFN- γ responses to these antigens in endemic areas revealed antigens that are only recognized in *M. leprae* infected/exposed individuals. Use of such antigens in user-friendly LF assays as alternatives to ELISA-based assays to detect IFN- γ in response to *M. leprae*-specific antigens will contribute to prevention of leprosy-induced disabilities further transmission by otherwise undiagnosed and untreated index cases.
- 12:35 - 13:10 **Schistosomiasis: what is being done to control it?**
Professor Mike Doenhoff, School of Biology, University of Nottingham, UK
Schistosomiasis is the second most important parasitic disease after malaria, with 200 million people infected and 600 million at risk in over 70 countries. The seriousness of the disease, for long underestimated, is beginning to be better comprehended. Most morbidity is in sub-Saharan Africa. Control programmes are being undertaken, based on use of the exceptionally good drug praziquantel to reduce morbidity, mainly in school children. Praziquantel is however the only drug available for this disease, giving rise to fears about drug-resistance. Interest in developing alternative drugs is increasing, and mining the genome should help accelerate this trend. The lack of field-suitable diagnostic tests for use in conjunction with the drug-based control programmes needs to be addressed.

- 13:10 –14:00 **Lunch and Poster Viewing**
- 14:00 – 14:35 **Differential Th responses and the implications for HIV-1 infection**
Dr William A Paxton, University of Amsterdam, The Netherlands
HIV-1 infection undoubtedly occurs in combination with other Diseases and since a large number of people living with HIV-1 reside in sub-Saharan Africa these will likely be TB as well as an array of parasitic pathogens, including Malaria or helminthes. How the HIV-1 develops in such individuals is still poorly understood but some in vitro data indicates that the Th stimulation profile can determine HIV-1 replication suggesting that differential immune responses May impact on the HIV-1 disease course. We are currently studying the in vitro CD4 environment and how this can influence HIV-1 replication as well assaying the stimulatory response in HIV-1 and TB co-infected individuals. Understanding better which Th responses are preferentially infected with HIV-1 may provide insight into what responses should or should not be stimulated in a successful HIV-1 vaccine.
- 14:35 – 15:20 **Malaria vaccines**
Dr. Alan Thomas , Biomedical Primate Research Centre, Rijswijk, The Netherlands
Malaria vaccine development has reached an exciting juncture. Mosquirix, the most advanced candidate, targets a single molecule expressed in early developmental phases of the parasite. As Mosquirix enters advanced clinical trials it is timely to consider other vaccine approaches that are being considered, to set these within the context of a parasite genome of some 5000 genes and to consider the tools available to select between promising vaccine candidates and accelerate progress towards the clinic.
- 15: 20– 15:45 **Afternoon Tea/Coffee and Last Poster Viewing**
- 15:45 – 16:30 **Oral presentations**
- 16:30 – 17:00 **Correlates of protection in co-infections**
Dr. Roberto Nisini, Istituto Superiore di Sanità, Italy
In Developing Countries a severe burden of infectious diseases caused by an array of different types of bacteria, worms and parasites is associated to poverty, malnutrition, scarce hygiene and dirty drinkable waters. Moreover, these diseases often occur in individuals who are also affected by HIV/AIDS, MA or TB, making the problem even more serious and, due to the high prevalence of these diseases, co-infections are the rule rather than the exception in many geographical areas. Coordinated experimental approaches designed to dissect the different component of immune response to co-infections are required for a more accurate diagnosis and vaccine design.
- 17:00 **Chairman's summing up.**

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About the Chair

Professor P.K. Das is retired as Associate Professor in Immunology and Head of the Research Group of Experimental Dermato Immuno Pathology, Department of Pathology, Academic Medical Center University of Amsterdam(AMC-UvA), Netherlands,(however still active as a Free Lance Research Consultant at AMC-UvA and also continuing as Professor of Chronic Inflammation/Immunodeficiency, at the Institute of Paediatrics, Faculty of Medicine, University of Brescia, Italy.I am a UK citizen, studied Biochemistry with a Ph.D.degree from London University and worked as an University Academic in London University, Hong Kong University, McGill University(Canada), University of Hamburg(Germany) until settling down in Netherlands. Since last 30 years worked as an Immunologist then as immunopathologist in University of Amsterdam until the retirement at the age of 65 years.Since last twenty five years devoted the research career in immunopathology of Tropical Diseases like Leprosy, Schistosomiasis, Tuberculosis and

relevant inflammatory tissue reaction. He has authored more than 200 publications in various Peer reviewed journals and chapters of Book and popularising articles. His scientific publications scan the field of Enzymology, Human Genetics, Neuro science and since last 30 years in the field of inflammation, immunity, infection and immunodeficiency. Supervised more than 20 \Ph.D. students of different Nationality. His current interests among others is in the development of tropical medical research and education with a relevance to global health in an active co-operation with Brazil and India, in an Honorary Capacity

About the Speakers

Prof. F. Castelli, MD is specialist in Infectious Diseases and Tropical Medicine and Director, Post-Graduate School in Tropical Medicine, University of Brescia (Italy). In the last 25 years, he has carried out research projects in many Countries in Africa, Asia and Latin American. He has authored more than 130 publications on peer-reviewed journals, mainly focusing on HIV infection, parasitic and tropical diseases, travel and imported infections. He has also authored 88 chapters of Books and Manuals and edited 1 Book on Infectious and Tropical Diseases (in Italian). He is the President of the Italian NGO Medicus Mundi Italy

Professor Michael Doenhoff obtained his first degree in Microbiology from Reading University (1967); PhD in Immunology, followed by post-doctoral research at Institute of Cancer Research, London. Research fellow and Senior lecturer at London School of Hygiene and Tropical Medicine, 1975-1990. Reader and Professor at University of Bangor, 1990-2007. Currently emeritus professor, School of Biology, University of Nottingham. 200+ publications; 30-something years research on schistosomes and schistosomiasis. Particular interests in chemotherapy, drug resistance, development of a vaccine and diagnostic tests, as well as in the biology and immunobiology of these fascinating parasites.

Dr. Annemieke Geluk 1988 Research Assistant, Dept. Chemistry, University of Virginia, Charlottesville, USA, 1989 – 1995 PhD student, Dept. Immunohematology and Blood, Transfusion Dept. IHB, LUMC, NL, 1993 Research Associate, Cytel Corporation, San Diego, USA, 1995 – 1996 Research Scientist, Dept. IHB, LUMC, NL, 1996 – 1997 Visiting Scientist, Dept. Immunology, Mayo Clinic, Rochester, USA, 1996 – 2001 Fellow of Royal Dutch Society of Arts and Sciences, Dept. IHB, LUMC, NL, 2001 – 2006 Senior Scientist, Dept. IHB, LUMC, NL, 2007 – now Assistant Professor, Dept. Infectious Diseases, LUMC, NL

Honors: 1994 Nomination “Herman Boerhaave” Award for young scientists in Immunology, 1999 Recognition as experimental animal expert (article 9), 1999 – now Member of the Scientific Board, Dept. IHB, LUMC, 2004 – now Member & coordinator of T cell group of the IDEAL consortium (Initiative for Diagnostic & Epidemiologica Assays for Leprosy)

The scientific activity of *Dr. Nisini* encompasses several aspects in immunology of infectious diseases and allergology, with the publication of more than 100 papers mainly on international, peer reviewed scientific Journals.

In the last years, the scientific activity has been focused mainly on the following topics:

- *In vitro* studies of cellular immunology for the identification of pathogenetic model of infectious diseases aimed at defining new approaches to immunointervention.

- *In vivo* studies on new adjuvants for the modulation of the innate and adaptive immune response aimed at improving available vaccines.

Dr Roberto Nisini has a degree in medicine and surgery, specialization in internal medicine, specialization in allergology and clinical immunology *Research*. The scientific activity of Dr. Nisini encompasses several aspects of immunology and allergology, with the publication of more than 90 papers mainly on international, peer reviewed scientific Journals. In the last years, the scientific activity has been focused mainly on the following topics;

In vitro studies of cellular immunology clinical oriented and aimed at the definition of pathogenetic model of infectious diseases and aimed at the definition of new approaches to vaccination.

In vivo studies of new adjuvants for the modulation of the innate and adaptive immune response aimed at the definition of new strategies for vaccination using pathogen derived polysaccharides.

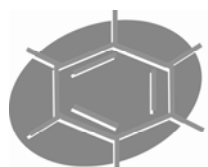
Alan Thomas obtained his PhD in molecular targets for malaria vaccines in the lab of Prof Sidney Cohen at Guy's Hospital in London before moving to the US to undertake 3 years postdoctoral work at Walter Reed Army Institute of Research. He subsequently started his own group at University of Maryland in Baltimore evaluating development of a vaccine based on AMA1 and 3 years later moved to the BPRC in the Netherlands to establish a new group. The group became a department that now has activities in fundamental malaria biology as well as development and evaluation of malaria and tuberculosis vaccines and malaria drugs. He has led development of a malaria vaccine that has been clinically tested in Europe and Africa and a second generation vaccine is currently in pre-clinical development.

Dr WA Paxton undertook his PhD studies at the Imperial College of Science, Technology and Medicine, University of London, on the characterization of immune responses against specific antigens from the filarial nematode *Brugia Malayi*, the causative agent of elephantiasis. During his postdoctoral studies at the Aaron Diamond AIDS Research Center, Rockefeller University, New York, he

mainly focussed on studying host factors that can be associated with HIV-1 infection and as involved with the identification that a deletion in the CCR5 chemokine receptor can provide a high level of protection against HIV-1 transmission and disease progression. He is currently an Assistant Professor in the Laboratory of Experimental Virology, AMC, University of Amsterdam where he has continued studying host viral interactions. More recently his research group has identified a factor in human milk that can bind to DC-SIGN expressed on dendritic cells and prevent virus capture and transfer to CD4 cells. His research group are also studying HIV-1 infection in the context of TB and malaria and which CD4 cellular phenotypes are preferentially infected

Professor. John Trowsdale,

1973-1975, European Fellow of the Biochemical Society, Centre de Gene Moleculaire, CNRS, Paris
1975-1979 Post-Doctoral Research Fellow, Scripps Clin & Res Foundation, La Jolla, CA, US
1980-1990 Imperial Cancer Research Fund, UK
1990-1996 Principal Scientist, ICRF, UK
1997-2009 Head of Division of Immunology, Dept of Pathology, Cambridge, UK



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