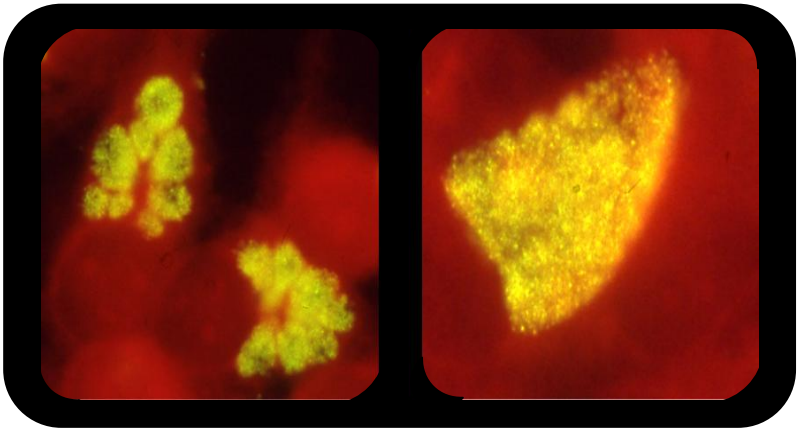
5th AACM

Fifth Annual Amsterdam

Chlamydia Meeting



VU University Medical Centre
Amsterdam

9 December 2008
9.30 – 17.00

Preface

Welcome: this year we organize our Annual Anmsterdam *Chlamydia* Meeting for the fifth time, and we included, like last year. all *Chlamydiae* species, including *C. pneumoniae* and *C. psittaci*.

We are confident that our foreign key-note speakers: Prof Michael Ward (UK), Prof. Andreas Pospischil (CH), Prof Angelika Stary (AT), Prof Gilbert Greub (CH), Ansumana Sillah (GM), Dr. Jane Hocking (AU), and Prof. Kathy Kelly (CA, USA), together with the Dutch speakers will spark the minds of both young as well as established Chlamydiologists and trigger valuable discussions this day and enrich the Proceedings of this Symposium!

The Laboratory of Immunogenetics: it was established by Emeritus Prof. A. Salvador Peña in 1992, and has become part of the Department of Pathology (Head Prof. Chris J.L.M. Meijer) in 2005. The Laboratory links fundamental scientific research and clinical applications (translational research). Research is divided into two interactive and productive lines: chronic inflammatory diseases (J.B.A. Crusius, PhD) and infectious diseases (S.A. Morré, PhD; from Jan 1st, 2008, Head of the Laboratory of Immunogenetics).

Studies in twins and adopted children have shown that host genetic factors form an important element in the susceptibility to and the severity of infectious diseases such as *Chlamydia trachomatis*, *C. pneumoniae* and *C. psittaci* infections in humans. Bacterial, environmental and host genetic factors determine the clinical course of the *Chlamydiae* infections and an integrated multi-disciplinary approach is used to study these factors.

Acknowledgements: We would like to thank our main sponsor, Roche Diagnostics, without their support this meeting would not be possible in current format. We would also like to thank the other sponsors and those involved in the organization of this meeting: Jolein Pleijster, Ouafae Karimi. We like to express our profound gratitude to Prous Science, in Barcelona, in particular to Dr. Joseph R. Prous, President, for the continuous support for Immunogenetics and for his contribution to make the publication of the proceeding possible a special supplement of the journal “Drugs of Today” in 2009.

Servaas A. Morré
Head of the Laboratory of
Immunogenetics

Sander Ouburg
Postdoc
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Cover photographs: Immunofluorescence staining of *Chlamydia trachomatis* within epithelial cells. HeLa cells were infected with a clinical isolate and stained with a monoclonal antibody specific for the major outer membrane protein (OmpA) of *C. trachomatis*. The left panel shows a nonfusogenic phenotype, while the right panel shows a fusogenic phenotype. Images courtesy of Yvonne Pannekoek, Department of Medical Microbiology, Academic Medical Center, Amsterdam, The Netherlands.

Programme

9.00 – 9.30	**Registration to the symposium (Foyer)**
9.30 – 9.40	Opening: Dr. Servaas Morré
9.40 – 11.00	*Chlamydia* websites and typing
9.40	Em. Prof. Micheal Ward (UK) *www.chlamydiae.com: Tod und Verklärung*
10.05	Dr. Arie van der Ende (NL) *Multi locus sequence typing of Chlamydiales: clonal groupings within Chlamydia trachomatis and host associated genotypes of Chlamydophila psittaci*
10.30	Koen Quint (NL) *Development of a Chlamydia trachomatis amplification, detection, and genotyping assay*
10.45	Drs. Reinier Bom (NL) *Identification of driving factors in high-risk Chlamydia trachomatis transmission-networks among MSM in Amsterdam using molecular typing and mathematical modelling*
11.00 – 11.30	**Coffee Break (Foyer)**
11.30 – 12.20	*Chlamydia trachomatis* diagnostics
11.40	Prof. Angelika Stary (AT) *Urine, urethral, or penile swabs: what is the best sample type for Chlamydia diagnosis in men?*
11.55	Prof. Paul Savelkoul (NL) *The validation of the StarLight concept for high throughput detection of Chlamydia trachomatis and Neisseria gonorrhoea*
12.20 – 13.10	**Lunch (Foyer)**
13.10 – 14.15	Non *Chlamydia trachomatis*
13.10	Prof. Andreas Pospischil (CH) *Chlamydial persistence: In vivo and in vitro findings*
13.35	Dr. Gilbert Greub (CH) *Pathogenic role of Chlamydia-related organisms*
14.00	Ir. Veerle Dickx (BE) *Bioaerosol monitoring for Chlamydophila psittaci in poultry slaughterhouses*
14.15 – 15.05	*Chlamydia screening*
14.15	Dr. Jane Hocking (AU) *Evaluating Chlamydia screening in Australia – issues for consideration*
14.40	Dr. Eline op de Coul (NL) *Chlamydia Screening Implementation Netherlands: preliminary results*
15.05 – 15.30	**Coffee break**
15.30 – 17.00	*Chlamydia trachomatis* clinical studies and vaccination
15.30	Prof. Kathy Kelly (US) *Advances in Vaccines for Chlamydia trachomatis*
15.55	Ansumana Sillah (GM) *Risk factors for active trachoma in The Gambia*
16.20	Dr. Henry de Vries (NL) *Can C. trachomatis serological assays help detecting asymptomatic LGV cases?*
16.45	Dr. Ingrid Rours (NL) *Chlamydia trachomatis infection during pregnancy causes preterm delivery*
17.00 – 17.05	**Closing remarks**
17.05 – 18.00	**Drinks (Foyer)**

Michael Ward, PhD

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Curriculum Vitae

Michael Ward was Professor of Medical Microbiology of the University of Southampton, in the United Kingdom. He graduated in Microbiology from University College, London University in 1967 and completed a PhD on *gonococci* in 1970 under Professor Alan Glynn at the Wright-Fleming Institute of St Mary's Hospital, London (where penicillin was discovered). He moved to the "new" medical school at Southampton in 1972 and has been unwilling to leave ever since.

His early work concerned the pathogenesis of *gonococcal* infection. He published the first electron micrographs of the in vivo adhesion of *gonococci* to human epithelia and described the process by which gonococci invade perfused human fallopian tube in vitro. One of the few people in the world to have been vaccinated with self-prepared *gonococcal* pilli, a major *gonococcal* adhesion factor, he lamentably lacked the courage to 'bed test' this ' vaccine' when its unsuitability became clear! In 1979 he switched to *Chlamydiae* as an alternative model of exploring bacterial invasion of human cells. His was one of three groups which in 1981 co-discovered the *Chlamydial* major outer membrane protein (MOMP), which remains the main *Chlamydial* vaccine candidate. This was followed, in collaboration with Ian Clarke and others, by the initial characterization of genes encoding various *Chlamydial* surface or envelope antigens and, with Wayne Conlan, the high resolution mapping of neutralizing epitopes on MOMP. A fruitful collaboration with David Mabey and Robin Bailey followed on the molecular epidemiology of trachoma in The Gambia, W. Africa. His interest in *gonococcal* and *Chlamydial* infections resulted in him serving for 6 years on the steering group of the WHO task force on infertility. In collaboration with cardiologist Yuk-ki Wong and others, he has published a series of papers challenging accepted thinking on the role of *Chlamydophila pneumoniae* in coronary artery disease. He is the author of a large number of papers on *Chlamydial* infections and contributed the chapter on *Chlamydial* disease mechanisms to the current authoritative American Society of Microbiology Book on *Chlamydia* (1999).

An increasing role in IT and e-learning resulted in him becoming, as well as a microbiologist, the Director of the Information and Computing Division in Southampton. This provided the technical background for the spare time development of the www.chlamydiae.com web site. He became an Emeritus Professor in September 2004 but maintains his broad-based interest in *Chlamydial* infections.

Abstract

The chlamydiae.com website was launched in 2002. From the outset the site was intended to cover the rich and interesting diversity of the Order *Chlamydiales*, hence the choice of url. The website consists of two sections with different target audiences. For the general public, the health information section provides information on *C. trachomatis* genital tract infections and has been accredited by the health on the net foundation. The much larger chlamydiae.com professional is targeted at *chlamydial* researchers and health professionals and provides comprehensive overviews of the *Chlamydiales* hyperlinked to primary literature. The site is number one in Google for the search term '*Chlamydiae*' and number 11 for the search term '*chlamydia*'. It receives approximately 1,600 visitors a week.

In the enthusiastic early years the site rapidly developed into a monster of some 470 reviews. The intention was to provide a critical overview of developments in the field, while not attempting to duplicate the work of the specialist genome oriented databases. Feedback indicates the site has been particularly appreciated by incoming research students and by scientists in related fields wanting an organism-based "shop window" of what was going on in the *chlamydial* field. Controversy has always been welcome and the site was an influential early supporter of the Anderson Everett taxonomy of the *Chlamydiales*. However, as is typical of a webmaster-driven web 1 application, it has proved difficult to keep the site up to date, particularly when I was a nautical wanderer.

"Death" is inevitable for the site in its present form. "Transfiguration" depends on much wider participation by the *chlamydial* research / health community. Following consultation, it is planned to redevelop the site as a bottom up, web 2 application, a wiki, which could be updated by any member of the community using a simple web browser. Some of the problems which this approach presents will be presented and audience views will be sought.

Arie van der Ende, PhD

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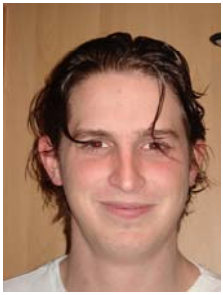
Curriculum Vitae

Arie van der Ende received his doctoral diploma at the University of Groningen where he studied Chemistry with specialization Biochemistry. He graduated in Utrecht (1983) in Molecular Genetics at the Institute of Molecular Biology, University of Utrecht on the DNA replication of bacteriophage Øx174. From 1983 to 1985 he was a post-doctoral fellow at the laboratory of Arthur Kornberg, Department of Biochemistry, Medical School, Stanford University at which he worked on the in vitro DNA replication of *E. coli*. From 1985 to 1992 he held a position at the Department of Cell Biology, University of Utrecht and worked on transcellular transport in epithelial cells. Since 1992 he is appointed as Associate Professor at the Department of Medical Microbiology, Academic Medical Center, Amsterdam. His main interest are the pathogenesis and molecular epidemiology of *N. meningitidis*. Since 2006 he is head of the Netherlands Reference Laboratory for Bacterial Meningitis.

Abstract

The obligate intracellular growing bacterium *Chlamydia trachomatis* causes diseases like trachoma, urogenital infection and lymphogranuloma venereum with severe morbidity. Several serovars and genotypes have been identified, but these could not be linked to clinical disease or outcome. The related *Chlamydophila pneumoniae*, of which no subtypes are recognized, causes respiratory infections worldwide. *Chlamydophila psitacci* generally have birds as hosts, but can cause respiratory infection in humans. We developed a multi locus sequence typing (MLST) scheme based on the partial sequences of seven housekeeping genes to understand the population genetic structure of *Chlamydiales* and the diversity of these species and to evaluate the association between genotype and disease. The population structure of *Chlamydophila pneumoniae*, *Chlamydia trachomatis* and *Chlamydophila psitacci* will be discussed. In addition, the *Chlamydiales* MLST website at http://pubmlst.org/chlamydiales/ will be introduced.



Koen Quint

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Curriculum Vitae

K. Quint (k.d.quint@umail.leidenuniv.nl, born 15-12-1984). At this moment he is in his final year for the Master of Biomedical Science as well as Medical school. During his study he was a coworker for DDL Diagnostics Laboratory, where he developed a Ct- amplification, detection and genotyping assay. This was the start of his PhD project. In 2007 he did a 6 months internship at the Weill Medical College of the Cornell University in NY. He investigated the association between the different HPV types and the natural course of a LSIL lesion. The role of Ct in the course of LSIL lesions was also investigated.
At this moment he is working in collaboration with the National Cancer Institute (USA) on a project to investigate the role of Ct as co-factor in development of cervical cancer and with the VU Amsterdam on serovar distribution studies in different populations.

Abstract

Chlamydia trachomatis (Ct) comprises distinct serogroups and serovars. The present study evaluates a novel Ct amplification, detection, and genotyping method (Ct-DT assay). The Ct-DT amplification step is a multiplex broad-spectrum PCR for the cryptic plasmid and the VD2-region of Ompl. The Ct-DT detection step involves a DNA enzyme immunoassay (DEIA)
using probes for serogroups (group B, C, and intermediate) and the cryptic plasmid, permitting sensitive detection of 19 Ct serovars (A, B/Ba, C, D/Da, E, F, G/Ga, H, I/Ia, J, K, L1, L2/L2a, and L3) without any cross-reactivity with other *Chlamydia* species and pathogenic bacteria or commensal organisms of the genital tract. Ct-positive samples are analyzed by a
nitrocellulose-based reverse hybridization assay (RHA) containing probes for the 19 different serovars and for the cryptic plasmid. The sensitivity of the Ct detection assay on clinical specimen is equivalent to that of the Roche Cobas TaqMan assay (McNemar's p=0.999). and significant more Ct positive samples were detected with the Ct detection assay compared with the Ct Hybrid Capture2 test from Digene (McNemar's p=0.03). The genotypings assay is an excellent method for serovar distribution studies, investigate the role of Ct as co-factor in development of cervical cancer and natural course studies.

Reinier Bom, MSc

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Curriculum Vitae

Reinier Bom was born on June 24¬¬th of 1982 in Schore, the Netherlands. He studied Medical Biology at the University of Amsterdam and focused on infectious diseases in combination with biochemistry, mathematical modelling and social behaviour. After his graduation in 2008, he started his PhD-study on the molecular epidemiology of *Chlamydia trachomatis* at the Public Health Laboratory of the Amsterdam Health Service.

Abstract

INTRODUCTION: This project aims to identify factors driving the current spread of STI among MSM in Amsterdam. We will combine epidemiologic data and mathematical modelling with the molecular typing of strains of *Chlamydia trachomatis* (CT). We will set up cluster detection analyses using molecular typing to identify persons belonging to the same transmission networks. We will also identify and describe high-risk transmission networks and associated factors that are critical to target for an effective STI control.

METHODS & MATERIALS: Samples for detection of CT infection will be collected from participating MSM who visit the STI clinic during a one-year period. HIV-infected MSM in care at the HIV Treatment Centre of the Academic Medical Centre will be sampled once during 2008. All participating MSM will provide urethral and anal samples for CT testing. All CT-positive isolates from clinical samples will be genotyped using multi-locus sequencing typing (MLST) and multi-locus VNTR analysis (MLVA).

RESULTS & CONCLUSION: -

Angelika Stary, MD, PhD

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Curriculum vitae

A. Stary has graduated in medicine from the Medical University in Vienna, was subsequently trained in Dermatovenereology, and got the university degree as "Universitätsdozent" and further on, in 2004 the title "university professor" from the University of Vienna.
Since 1988 she is the head of the Outpatients` Centres for Diagnosis of Infectious Venero-Dermatological Diseases in Vienna. She has been reelected as the chair of the STD Council group of the Austrian Society for Dermatology and Venereology in November 2007, a position she held already from 1999 to 2005.
She has a special interest in *chlamydial* infections and diagnosis of sexually transmitted infections, and organized and chaired the Third European *Chlamydia* Meeting in 1996 in Vienna. She has published results of several multicentre comparison studies on *chlamydial* diagnosis conducted in Europe and got practical experience with all available diagnostic *Chlamydia* tests. She has been elected as Board Member of the ISSTDR from 1999 to 2005 where she still holds the position as an ex officio member. From 2001 until 2005 she acted as the Regional Director of the European Branch of the International Union against Sexually Transmitted Infections (IUSTI) and has organized the IUSTI-Europe Congress 2002 in Vienna with about 500 participants. At the IUSTI world conference in Bangkok in November 2005 she was nominated as the worldwide president of the IUSTI and will hold this position until 2009 after her reelection in Seattle 2007. She is Honorary Member of BASHH and the Hungarian Society for STI.

Abstract

Nucleic acid amplification tests (NAATs) are a challenge for chlamydia diagnosis providing a high detection rate for different specimen types of symptomatic as well as asymptomatic individuals. The number of NAATs has increased during the last years and includes DNA- as well as RNA-targets which are amplified by different technologies, such as COBAS Amplicor, ProbeTec, RealTime, and APTIMA Combo2 (AC2). These assays are FDA approved for cervical, urethral, and urine samples and some of them also for vaginal specimens. Using noninvasive specimens for chlamydia screening, NAATs provide high sensitivities for urine and vulvovaginal samples in women, and urine for men. In a first

comparison study with the AC2 and ProbeTec penile swabs were evaluated as an alternative second noninvasive sample type in men. In this study specimens were recommended only for the AC2 as a high sensitivity-technology. Further data were collected for a further comparison of the AC2 with RealTime technology using urine, urethral, and penile swabs in symptomatic and asymptomatic individuals. The results demonstrate that the detection rates of the AC2 and RealTime in symptomatic men were highest for urethral swabs with 100% and 91.1%, respectively, followed by urine with 97.3 and 89.2%, respectively, and by penile swabs with 91.9% and 73%. The bacterial load in penile samples was significantly lower than that of urine or urethral samples. Penile swabs can therefore only be recommended for chlamydia screening if other samples are not available and high sensitivity technologies are used.

Paul Savelkoul, PhD

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Curriculum Vitae

Prof. Dr. Paul HM Savelkoul graduated in Biology (specialization Medical Biology B5*) in 1988 at the University of Utrecht, The Netherlands. After graduation a PhD study was started at the department of veterinary Bacteriology, University of Utrecht under auspices of prof. dr Ben van der Zeijst. In 1992, he received his PhD-degree on the development of detection and characterization of adhesion factors of *Bordetella*. Subsequently, in 1992 a position at the University hospital Maastricht was accepted to set up a molecular laboratory for HLA typing. This was achieved after three years and the HLA typing was performed on a molecular basis for solid organ transplantation purposes. In 1995 he joined the group of prof. dr. Christina Vandenbroucke-Grauls at the VU University in Amsterdam as an assistant professor. Within the department of Medical Microbiology & Infection Control he was involved in setting up a molecular typing laboratory, molecular diagnostics, microbiological research & education. In 2000 he was appointed associated professor in molecular microbiology at the VU University medical center in the same department as head of the molecular diagnostics and molecular epidemiology. In 2006 he was appointed professor in molecular epidemiology at the same institute and head of the translational molecular research of the department. He has published over 100 papers in the fields of molecular microbiology, molecular epidemiology, HLA typing and human genetics related to basic research and applied and translational research.
Currently, he is involved in clinical molecular diagnostics both in the field of infection control and patient care. Research is focused on three subjects: bacterial blood stream infections, chronic gastrointestinal diseases and molecular epidemiology especially the spread of epidemiological strains and mobile DNA elements.

Abstract

At present, molecular detection of pathogens require more and more a high level of automation and flexible workflow to handle the increasing amount of samples. The StarLight concept aims to fulfill these requirements by integrating automated sample preparation and PCR set-up (Hamilton Robotics), followed by a real-time PCR assay on the LightCycler® 480 system (Roche Applied Science). The

VUmc, 9 december 2008

StarLight concept is now validated for simultaneous detection of *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoea* (NG).

For validation the automated CT/NG assay on the StarLight concept is compared to the CT/NG assay on the Cobas® Amplicor® (Roche Molecular Systems). At least 2000 clinical samples, including male and female urines and swabs, have been aliquoted and tested on both platforms in routine workflow.

No significant difference between the two methods has been observed. The StarLight concept provides a flexible workflow solution for high throughput laboratories in a routine setting and has the potential for other *e.g.* homebrew assay applications.

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Curriculum Vitae

Andreas Pospischil, born in Vienna, Austria in January 1948 moved with his parents to Munich in 1954 where he was raised, went to school and studied Veterinary Medicine at the University of Munich, Germany from 1968 to 1973. After a short period in veterinary large animal practice until 1975 he returned to the Veterinary Faculty at University of Munich, Germany to work on his DVM thesis in veterinary virology completed in 1977. In 1978 he joined the staff of the Institute of Veterinary Pathology at the Veterinary Faculty at University of Munich, Germany to be trained first in electron microscopy later in anatomic pathology and biopsy diagnostics. Infectious diseases of the gastrointestinal tract of animals evolved to be his main research interest leading to “Habilitation” with experimental mixed infections of calves with enterotoxigenic *E. coli* and Rota virus in 1984. This was followed by a postdoc period of 2 years at the National Animal Disease Center in Ames, Ia. USA, working on experimental infections on *Salmonella* carrier state in pigs. During these experiments the presence of *Chlamydia* in the gastrointestinal tract of pigs was recognized for the first time. Returning to Europe he joined the BASF AG at Ludwigshafen, Germany to set up an electron microscopy laboratory in the area of toxicologic pathology. In 1987 he had the chance to move to the University of Zurich, Switzerland to become head of Department Veterinary Pathology. Since that time *Chlamydia* and *Chlamydia* related diseases in animals and their zoonotic implications are his main research focus.

Abstract

The phenomenon of persistence is well known from in vitro studies, where it is associated with the production of aberrant bodies, but its occurrence in vivo is less well documented.
In this study we describe the ultrastructural morphology and antigen labeling of aberrant bodies in spontaneous and experimental *Chlamydia suis* infections in the intestine of pigs and compare the findings to those published in *Chlamydophila pneumoniae* in human atherosclerotic tissue and in vitro (*Chlamydia trachomatis* and) *Chlamydophila pneumoniae*) under an interferon-gamma (IFN-gamma)

induced model of *chlamydial* persistence. The suitability of immunohistochemistry using tissue microarrays (TMA) and immunogold electronmicroscopy against *chlamydial* heat shock protein 60 (cHSP60) and other *chlamydial* proteins (GroEL, GroES, GspD, Ndk and Pyk LPS/MOMP) to detect such forms is discussed.

Gilbert Greub, MD, PhD, MER PD

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Curriculum vitae

Dr Gilbert Greub is a Swiss medical doctor. He studied medicine at the University of Geneva and then moved to Lausanne where he specialized successively in internal medicine (FMH), in infectious disease (FMH), and in clinical microbiology (FAMH). During that period, he obtained a MD, a PhD and a certificate in tropical medicine. He did his postdoctoral fellowship in Professor Raoult's laboratory in Marseille, where he specialized on intracellular bacteria.

Currently, he shares its time between (i) teaching activities to biology students, and medical students of the University of Lausanne, (ii) research activities as group leader at the Institute of Microbiology of the University of Lausanne, (iii) infectious diseases as attending physician, (iv) head of the laboratory for diagnostic parasitology (v) head of medical bacteriology, and (vi) R & D program director.

He received in 2006 the Young Investigator Award from the European society for Clinical Microbiology and Infectious Diseases for his research on *Chlamydia*-like organisms and is supported since 2007 by the Leenards Foundation through a career award in medicine.

Abstract

Chlamydia-like organisms, such as *Parachlamydia acanthamoebae* may easily grow within free-living amoebae and may thus use these widespread protists as a cosmopolite aquatic reservoir, replicative niche and vector. The presence of *P. acanthamoebae* within an amoeba recovered from the water of an humidifier during the investigation of an outbreak of fever suggested a pathogenic role of this *Chlamydia*-related bacteria. Additional molecular-based investigations and serological studies further supported its role in lower respiratory tract infections, including bronchitis, bronchiolitis, community-acquired pneumonia and aspiration pneumonia. Moreover, we showed that *P. acanthamoebae* may survive and replicate within human macrophages and pneumocytes. Furthermore, this strict intracellular bacterium also causes severe pneumonia in experimentally infected mice, thus fulfilling the 3rd and 4th Koch criteria for a pathogenic role.

P. acanthamoebae should thus be considered as a new agent of pneumonia. Other novel *Chlamydiae* such as *Simkania negevensis* and *Protochlamydia naegleriophila* might also cause lung infections. Moreover, another *Chlamydia*-related bacterium, *Waddlia chondrophila* was recently identified as a possible agent of miscarriage.

Veerle Dickx

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Curriculum vitae

Veerle Dickx was born in September 1984 in Bruges (Belgium). She studied Bio-Engineer option cell and gene biotechnology at Ghent University from 2002 till 2007. The same year, she started as a PhD student in the laboratory of Immunology and Biotechnology of the Animal Cell at Ghent University. Her research is situated in the field of detection and epidemiologic tracing of zoonotic transmissions of *Chlamydophila psittaci* from birds to humans.

Abstract

The zoonotic transmission of *Chlamydophila psittaci* (*Cp. psittaci*) from poultry to humans happens through infected aerosols. Therefore, it would be interesting to have a bio-aerosol monitoring technique at our disposal. In this study, we investigated one Belgian chicken slaughterhouse and one Belgian turkey slaughterhouse on the presence of *Cp. psittaci*. The incoming flocks, the workers and the air were examined. The workers were sampled at week one and four, with two pharyngeal swabs (one for nested PCR, one for isolation). They also gave a blood sample (for antibody ELISA). During week two, the incoming flocks were sampled with two pharyngeal swabs (one for nested PCR, one for isolation). In the same week, air samples were taken in the morning, at lunch and at the end of the day using two different bio-aerosol monitoring techniques: an IOM personal inhalable dust sampler with gelatin filter and a stationary MAS-100 eco-sampler with the self-designed collection medium, ChlamyTrap 1. Positive flocks and air samples were detected in both slaughterhouses, but the zoonotic risk seems higher in the turkey slaughterhouse as more workers were positive in PCR. The MAS-100 eco sampler was the best technique for *Cp. psittaci* bio-aerosol monitoring.

Jane Hocking, BAppSc (MLS) *RMIT*, MPH *Melb*, MHSc (PHP) *La Trobe*, PhD *Melb*

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Curriculum vitae

Jane Hocking is an epidemiologist at the Key Centre for Women's Health in Society at the University of Melbourne. Her research interests include the epidemiology and control of sexually transmitted infections, sexual health and behaviour and the use of mathematical models to aid decision making. Jane is a chief investigator on a number of projects that will inform future *Chlamydia* control policy in Australia; these projects include two randomized controlled trials assessing different methods for increasing *Chlamydia* screening in primary health care and a longitudinal study of young women aimed at estimating the incidence and re-infection rates of Chlamydia infection.

Abstract

Genital *Chlamydia* infection is an increasing public health problem in Australia. While annual *Chlamydia* screening is recommended for young men and women in Australia, less than 8% of this target group is screened each year. The Australian Government is currently considering pilot testing *Chlamydia* screening in a general practice setting. However, there are a number of factors unique to the Australian context that will impact how *Chlamydia* screening might work and how it should be pilot tested. These factors include the unique structure of Australia's health care system, its geographic diversity, great distances and isolation of many rural communities. This talk will discuss some of the issues and how these may impact on the design of the *Chlamydia* screening pilot program.

Eline op de Coul, PhD

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Curriculum vitae

Eline Op de Coul was born in Veldhoven, the Netherlands (1969). After she graduated at the Agriculture University in Wageningen, she worked on the molecular epidemiology of HIV-1 at the Amsterdam Public Health Service (GGD). After she finished her PhD thesis in 2001, she started working as an epidemiologist in the field of HIV/STI surveillance at the Centre for Infectious Disease Control at the National Institute for Public Health and the Environment (RIVM).

Abstract

Objective

Chlamydia trachomatis (Ct) is the most prevalent bacterial STI in the Netherlands, with an estimated 60.000 cases per year. Only about 1/3 of these infections are detected and treated. The Ministry of Health (MOH) decided to start a screening program in 3 regions.

Methods

The *Chlamydia* Screening Implementation is a large-scale intervention, piloting sustainable, selective, systematic and internet-based *Chlamydia* Screening during 2007-2010. All 315.000 sexually active 16-29 year old citizens of Amsterdam and Rotterdam are invited two times to participate in the screening; in the lower prevalence area South-Limburg only if they match a risk-profile. Eligible persons are retrieved from the population register and receive a letter either from the Public Health Service (PHS) or their GP. Via the website www.chlamydiatest.nl they will be able to get information, order a test package, get test results and download treatment guidelines for their health provider. The PHS will implement the screening; STI AIDS Netherlands (SA-NL) coordinates the program.

The evaluation is conducted by the RIVM, in collaboration with PHS and SA-NL. It aims to evaluate the feasibility and (cost) effectiveness of the program. To evaluate the effects of screening on population prevalence, a phased implementation (stepped wedge) will be used. The impact of screening will also be studied by using data from surveillance systems (laboratories, STI clinics, GPs, hospitals).

Results

Preliminary results from the first two months will be presented. 57.000 invitations were sent (1/6 of total). 10.754 persons ordered the test package. Of these, 8.454 (79%) returned a sample. Participation rates among women (20%) were higher than men (10%) and among persons ≥ 20 years old higher (17%) than teenagers (9%). 4.3% of the samples was Ct-positive. In general, participants were very enthusiastic about the internet-based character of the program. A non-response study showed that most important reasons for not participating were: (1) never sexually active, (2) assumed not being at risk (3) no time or interest (4) already tested in past 6 months.

Conclusion

The large scale design of this program provides not only individual benefits (early detection and treatment to prevent complications) but also enables studying the impact of screening on population prevalence. The results will be leading for the decision whether and how a national roll-out of Ct screening in the Netherlands will be implemented in the near future.

Kathleen Kelly, PhD

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Curriculum Vitae

Kathleen Kelly is an Associate Professor who joined the Department of Pathology and Laboratory Medicine at the University of California, Los Angeles in 1999. Dr. Kelly earned her B.S. in Medical Technology and PhD in Immunology at the Ohio State University in Columbus, Ohio. She studied the role of T cell subsets in germinal center formation as a postdoctoral fellow at Washington University in St. Louis. She then served as a junior faculty member in the Department of Microbiology and Immunology at the University of Arkansas for Medical Sciences. The focus of her lab is to understand how host immune responses are induced and regulated within mucosal sites, specifically immune responses in the reproductive tract caused by *Chlamydia trachomatis*. *Chlamydial* organisms are an important cause of pelvic inflammatory disease, ectopic pregnancy, and infertility in women. The laboratory is investigating how the route of immunization (mucosal *vs.* parenteral) and T-regulatory cells influence protective immunity and development of a vaccine. Dr. Kelly is actively involved in graduate and medical student education, is a recipient of the Young Scientist Award and past chair of the Immunology Division for the American Society of Microbiology.

Abstract

Generation of robust cell-mediated immune responses at mucosal surfaces while reducing overall inflammation is a primary goal for vaccination. While many potential antigenic targets have been identified for a vaccine against *Chlamydia trachomatis* infection, antigen delivery systems direct the formation of subsequent immune responses and influence the outcome of infection. Recently, nanoparticle delivery systems have been developed for genital infection with *C. trachomatis*. We report the use of a recombinant nanoparticle as a vaccine delivery platform against mucosal infections requiring T cell-mediated immunity. We encapsulated an immunogenic protein, the major outer membrane protein (MOMP) of *Chlamydia muridarum*, within hollow, vault nanocapsules (MOMP-vaults) that were engineered to bind IgG for enhanced immunity. Intranasal immunization with MOMP-vaults induced anti-*chlamydial* T cell-mediated and humoral immunity plus significantly attenuated bacterial burden at a distant mucosal surface. Thus, vault

nanoparticles containing immunogenic proteins delivered to the respiratory tract by the intranasal route are effective immunogens for inducing protective immunity at distant mucosal surfaces.

Ansumana Sillah

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Curriculum Vitae

Dr. Ansumana Sillah is the National Eye Care Programme Manager in the Gambia, involved in the organisation of eye care services including surgery for trachomatous trichiasis. He is the manager of the Health For Peace Initiative in eye care, providing trachoma and cataract surgical services in Senegal, Guinea, Guinea-Bissau and Gambia.

Abstract

Trachoma has been endemic in The Gambia for decades but national surveys indicate that the prevalence is falling. Risk factor data can help guide trachoma control efforts. This study investigated risk factors for active trachoma and ocular *Chlamydia trachomatis* infection in children aged below 10 years in two Gambian regions. The overall prevalence of *C. trachomatis* infection was only 0.3% (3/950) compared with 10.4% (311/2990) for active trachoma, therefore analyses were only performed for active trachoma. After adjustment, increased risk of trachoma was associated with being aged 1-2 years (odds ratio (OR) 2.20, 95% CI 1.07-4.52) and 3-5 years (OR 3.62, 95% CI 1.80-7.25) compared with <1 year, nasal discharge (OR 2.07, 95% CI 1.53-2.81), ocular discharge (OR 2.68, 95% CI 1.76-4.09) and there being at least one other child in the household with active trachoma (OR 11.28, 95% CI 8.31-15.31). Compared with other occupations, children of traders had reduced risk (OR 0.53, 95% CI 0.30-0.94). At the household level, only the presence of another child in the household with active trachoma was associated with increased risk of active trachoma, suggesting that current trachoma control interventions are effective at this level. In contrast, child-level factors were associated with increased risk after adjustment, indicating a need to increase control efforts at the child level..

Henry de Vries, MD, PhD

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Curriculum Vitae

Henry de Vries is a dermatologist-venereologist with expertise in infectious skin diseases especially sexually transmitted infections and tropical skin diseases. His PhD thesis in 1994 was focussed on cutaneous wound healing and was rewarded with the Leiden Hippocrates Study prize 1995, and the Sandoz Research Prize 1997. Recent research topics involve; lymphogranuloma venereum proctitis, an emerging STI in mostly HIV positive gay men in industrialised countries, cutaneous leishmaniasis, an emerging infectious ulcerative tropical skin disease, and the viral pathogenesis of lichen ruber planus. He works at the Amsterdam municipal health service STI outpatient clinic, with 27.000 patients/year by far the largest STI setting in the country, and at the University of Amsterdam, Academic Medical Centre, department of Dermatology.

Abstract

Lymphogranuloma venereum (LGV) in MSM is an ongoing epidemic in the western world. Gold standard diagnostics are LGV genovar specific *C. trachomatis* NAATs'. Although LGV can cause severe symptomatology, in about one third of the infections little to no physical complaints are present. Since LGV specific NAATs' are expensive and require specialized collection (*e.g.* proctoscopy) and lab conditions, there is a need for additional practical screening methods that must be able to detect asymptomatic LGV cases especially. An IgA anti-MOMP serological test could help to discriminate patients with LGV proctitis from other forms of proctitis, even in asymptomatic cases.

Ingrid Rours

Department of Medical Microbiology, Erasmus MC, University Medical Center, Rotterdam, The Netherlands

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Curriculum Vitae

G. Ingrid J.G. Rours obtained her medical degree in 1990 at the University of Amsterdam (UVA), The Netherlands. As an undergraduate she did field research in north-east Brazil concerning breastfeeding and malnutrition in infants for the Royal Institute of Tropical Medicine (Prof. J. Kusin) in Amsterdam. She also worked at the Department of Paediatrics of the Dhaka Institute of Child Health (Prof. Akbar) in Bangladesh and participated in shigellosis research at the International Centre for Diarrhoeal Disease Research in Dhaka.
After graduation, she worked as a medical office and specialized in paediatrics at the Chris Hani Baragwanath Hospital in Soweto, and the Johannesburg General Hospital and Coronation Hospital in Johannesburg, South Africa. She obtained an MMed Paediatrics Degree in 1998 at the Witwatersrand University in Johannesburg for her research on Chlamydial infections in mothers and their infants, in collaboration with the Department of Obstetrics and Gynaecology and the Department of Paediatrics at the Johannesburg General Hospital (Prof. A.D. Rothberg) and the Department of Sexually Transmitted Diseases in the South African Institute for Medical Research (Prof. R. Ballard). She then worked in general paediatrics at the Johannesburg General Hospital and at the child abuse clinic of the Transvaal Memorial Institute in Johannesburg. After returning to the Netherlands, she worked in general paediatrics in the Maasland Hospital, Sittard. This was followed by a subspeciality in neonatology at the Department of Neonatology of the UMC St Radboud Hospital, qualifying in 2000 at the University of Nijmegen. Subsequently, she worked in the Paediatric Outpatient Department and ran the Child Abuse Clinic at the Sophia Children's Hospital in Rotterdam, where she did a fellowship in paediatric infectious diseases. At present she is working on her PhD thesis in collaboration with the Department of Paediatrics (Prof. R. de Groot) and Department of Medical Microbiology and Infectious Diseases (Prof. H.A. Verbrugh) at the Erasmus University in Rotterdam.

Abstract

Context *C. trachomatis* infection is the most prevalent sexually transmitted infection and may influence pregnancy outcome.

Objective To assess the effect of *C. trachomatis* infection during pregnancy on premature delivery and intra-uterine growth retardation.
Design, Setting and Participants This *Chlamydia* study was embedded in the Generation R Study, a population-based prospective cohort study in Rotterdam, the Netherlands. The study was conducted between February 2003 and January 2005. Pregnant women, who attended a participating midwifery practice or antenatal clinic and who were expected to deliver in Rotterdam, were eligible for the study. A urine sample was obtained from 4,676 women, who were enrolled in the study. *C. trachomatis* was detected by PCR. Women completed a self-administered questionnaire and pregnancy outcomes were obtained from midwives and hospital registries.
Main outcome measures Prematurity and dysmaturity.
Results The prevalence of *C. trachomatis* infection was 3.9%. *C. trachomatis* infection was associated with preterm delivery, especially with early prematurity before 32 weeks (OR 4.35 [95% CI 1.25, 15.17]) and 35 weeks gestation (OR 2.66 [95% CI 1.08, 6.53]), but not with low birth weight. Of all preterm deliveries before 32 weeks and 35 weeks gestation in this region 14.9% [95% CI 4.5, 39.5] and 7.4% [95% CI 2.5, 20.1] respectively was attributable to *C. trachomatis* infection.
Conclusion *C. trachomatis* infection in pregnant women is an important risk factor for early premature delivery. *C. trachomatis* infection in pregnancy should be considered a public health problem, especially for young women in certain socio-economic groups.

Symposium Organizer
Servaas A. Morré

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Curriculum vitae

Servaas A. Morré, PhD, who is working on *Chlamydia trachomatis* for almost 12 years, graduated at the VU University, the Netherlands, in Biochemistry and Molecular Biology in 1994. He worked at The Zaadunie, Department of Cell biology on plant genetics: polyploidization of *Brassica oleracea* (Cauliflower) during cell culture (M. Tan, PhD) and at the Department of Biochemistry and Molecular Biology VU on processing of ribosomal RNAs in *Saccharomyces cerevisiae* (Prof. H. Raué, PhD, R. van Nues PhD).
As an Erasmus Fellow he studied at the Universidade Do Porto, Laboratório de Genética Molecular , Portugal , on POLO: an essential kinase for mitosis in *Drosophila melanogaster* (Prof. C. Sunkel, PhD). His PhD thesis performed in Department of Pathology (VU University) was on the epidemiology, diagnostics and immunopathogenesis of human urogenital *Chlamydia trachomatis* infections. As a postdoc, the Van Coeverden Adriani Foundation made it possible to extend his *Chlamydial* research in the Department of Infectious Diseases, The City of Hope Medical Center, California, USA, in collaboration with Dr. Jim Ito and Dr. Joseph Lyons, specialists in murine modeling. From November 1st 2001, he joined the Laboratory of Immunogenetics, VUmc. His research is focused on the immunogenetics of infectious diseases with still special attention to *Chlamydia trachomatis*, and also HIV (Prof. S. Danner & Dr. M. Agtmael)), periodontitis (collaboration with ACTA) and sepsis (collaboration AZM). Studies on Human Papilloma Virus (HPV) infections have been initiated together with Prof. C.J.L.M. Meijer in 2006. Together with Prof. Salvador Peña, he organised the “First Mini-symposium *Chlamydia trachomatis* Infections” in December 2004 and in December 2008 we organize already our fifth “Annual Amsterdam Chlamydia Meeting”. In July 2005 at the 16th Biennial meeting of the International Society for Sexually Transmitted Diseases Research (ISSTDR) he was a member of the Scientific Committee and organized amongst others the workshop “Immunogenetics of *Chlamydia trachomatis* Infections”, with Prof. David Mabey (London, UK, Trachoma research). He was organizing Committee member of 6th Meeting of the European Society for *Chlamydia* Research, University of Aarhus, Aarhus, Denmark, July 1-4, 2008 and at this meeting also session organizer: “Immunogenetics of *Chlamydia trachomatis* infections”. He will be the organizer of the 7th Meeting of the European Society for *Chlamydia* Research in 2012 in Amsterdam.
Together with Tjaco Ossewaarde and Yvonne Pannekoek, he coordinates the Dutch *Chlamydia* Working Party. He is coordinator of the International *Chlamydia* consortium ICTI (Integrated approach on *Chlamydia trachomatis* Infections), and since 2007 he is Scientific Consortium Director, of the European Framework Programme 6 (FP6) grant (LIFESCIHEALTH FP6, Co-ordination Actions (CA)) on functional genomics research entitled: “Contribution of molecular epidemiology and host-pathogen genomics to understand *Chlamydia trachomatis* disease (Acronym: EpiGenChlamydia)“ with 20 European, African and US groups. This consortium had his first meeting on 12 December 2007. As a partner he is participating in two other European FP6 programmes. Finally, together with Prof. Paul Savelkoul (Medical Microbiology and Infection Control, VUmc), he is co-founder and co-director of a VUmc spin-off company called Microbiome Ltd (Sept 2005), a company specializing in Microbiological diagnostics, typing and laboratory consultancy. From the first of January 2008 he is head of the Laboratory of Immunogenetics.

VUmc, 9 december 2008

An overview of PhD work in The Netherlands on *Chlamydia trachomatis*

Table I: *PhD theses in the Netherlands*

2007 Denise A.M. Perquin	University of Leiden / Medical Center Haaglanden
2006 Sander Ouburg	VU University Amsterdam
2006 Joke Spaargaren*	University of Amsterdam and VU University Amsterdam
2006 Tanja P. Gijsen*	Maastricht University
2006 Hannelore M. Götz*	Erasmus University Rotterdam
2005 Jan E.A.M. van Bergen*	University of Amsterdam
2004 Joseph M. Lyons*	City of Hope Medical Center, CA, USA, and VU University Amsterdam
2003 Laura S. Murillo	VU University Amsterdam
2002 Monica Molano Luque	VU University Amsterdam
2001 Irene G.M. van Valkengoed*	VU University Amsterdam
1999 Servaas A. Morré*	VU University Amsterdam
1999 Johannes W. Trum	University of Amsterdam
1999 Bernardus W.J. Mol	University of Amsterdam
1998 Yvonne T.H.P. van Duijnhoven	University of Amsterdam
1997 Marita J.W. van de Laar	University of Amsterdam
1995 Jar Lan*	VU University Amsterdam
1994 Josina van Ulsen	Erasmus University Rotterdam
1994 Jacobus M. Ossewaarde*	University of Utrecht
1993 Hans J.H. Theunissen*	Erasmus University Rotterdam
1992 Johannes T.M. van der Schoot*	University of Amsterdam
1992 Arent J.P. Boeke and Janny H. Dekker	VU University Amsterdam
1992 André H. van der Willigen	Erasmus University Rotterdam
1991 Eric C.J. Claas	VU University Amsterdam
1990 Gijsbertus J.H.M. Ruijs*	Rijksuniversiteit Groningen
1989 Henk J. Vonsée	Rijksuniversiteit Limburg
1987 Kie H. Tjiam*	Erasmus University Rotterdam

**Chlamydia trachomatis* is the major focus in the thesis.

Table II: *Current PhD fellows working (partially) on* Chlamydia trachomatis.

Janneke E. den Hartog	Maastricht University
Ingrid Rours	Erasmus University Rotterdam
Caroline J. Bax	University of Leiden / Medical Center Haaglanden
Arnold Catsburg	VU University Amsterdam
Vitaly Smelov	St. Petersburg State Medical University, Russia and VU University Amsterdam
Koen Quint	VU University Amsterdam
Laura van Dommelen	Maastricht University
Esmée Lanjouw	Erasmus University Rotterdam
Ouafae Karimi	VU University Amsterdam
Reinier Bom	University of Amsterdam

Attendants:

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	Bastiaans	Esther	Abbott B.V.	Esther.bastiaans@abbott.com
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	Vermeulen	Hans	BD Diagnositics	
Ir.	Verminnen	Kristel	University Ghent	Kristel.Verminnen@UGent.be
	Verweij	Stephan	VUmc, Amsterdam	s.p.verweij@vumc.nl
Dr.	Vries, de	Henry	AMC & GG&GD A'dam	h.j.devries@amc.uva.nl
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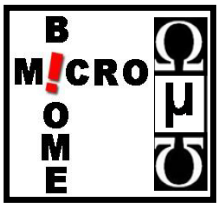

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Future STI / *Chlamydia* Meetings

4th Chlamydia Basic Research Society (CBRS)
March 20th- 23rd, Little Rock (AR) USA

1st International Conference on *Chlamydia trachomatis* infections
May 21st – 22nd 2009, Cernobbio (Como), Italy

18th ISSTDR / BASHH Meeting
June 28th – July 1st, 2009, London, UK
www.isstdr.org

IUSTI – AFRICA Regional Meeting
Early December 2009, Cape Town, South Africa
www.iusti.org/africameeting.html

6th Annual Amsterdam *Chlamydia* Meeting
December 2009, Amsterdam The Netherlands

12th International Symposium on Human *Chlamydia* Infections
June 20th – 25th, 2010, Fuchsl, Austria

7th European *Chlamydia trachomatis* meeting
2012, Amsterdam, The Netherlands

VUmc, 9 december 2008

Announcement

6th Annual Amsterdam *Chlamydia* Meeting

Mid December 2009

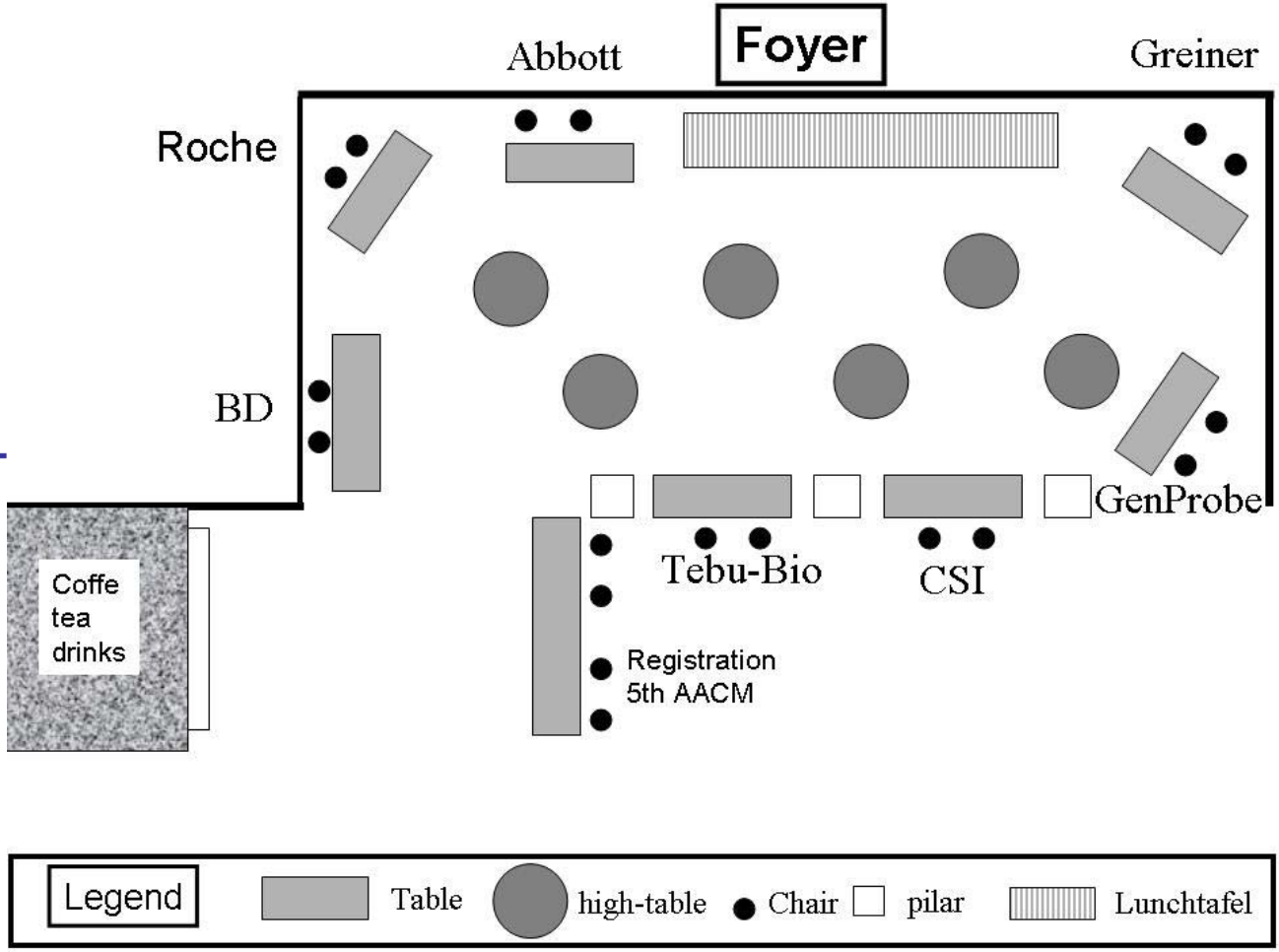
Organiser: Servaas Morré
Laboratory of Immunogenetics,
Dept. of Pathology, VUmc, Amsterdam

We hope to welcome you all in 2009

Notes

Notes

Floor plan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Legend
Table
high-table
Chair
pilar
Lunchtafel

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Accreditation is requested for this symposium from the Dutch Society for Medical Microbiology (NVMM)

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